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ABSTRACT

To determine if the Convergence Planning Technique, designed to identify research components and organize them in a logical manner on a matrix for analysis, could be applied to vocational education problems in Wisconsin, questionnaires composed of problems identified through literature reviews and interviews were distributed to vocational, technical and adult education administrators and board members and the project's steering committee. Data obtained were used in the construction of a matrix which when analyzed revealed five phases necessary to constitute a suitable research design. These phases are: (1) identification and analysis of needs, (2) development of systems designs, (3) specified sub-systems research, (4) procedures for integrating sub-systems with the existing system, and (5) evaluation. It was concluded that the Convergence Technique could be employed in vocational research planning. (SN)

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FINAL REPORT
Project No. 19-020-151-222

DEVELOPMENT OF A CONVERGENCE PLAN FOR VOCATIONAL EDUCATION IN WISCONSIN

June, 1972

WISCONSIN BOARD OF VOCATIONAL, TECHNICAL AND ADULT EDUCATION
Madison, Wisconsin

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Final Report

Project No. 19-020-151-222

Development of a Convergence Plan for Vocational Education in Wisconsin

Orville Nelson

Center for Vocational, Technical and Adult Education
University of Wisconsin - Stout

Menomonie, Wisconsin

June 30, 1972

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Chapter 1

THE CONVERGENCE PROJECT: PROBLEM AND OBJECTIVES

Summary

This project was undertaken to determine if the Convergence Technique could be applied to vocational education problems in Wisconsin to obtain a valid research plan. The Convergence Technique was designed to provide a flexible planning system for research. It provides a process for identifying the components of a research program and ordering them in a logical series of planning units which progress from general to very specific. Research activities are based on the logic or organization of the substantive area to be investigated. The research plan is graphically depicted in a matrix containing three major flows of activities and resources: (1) research; (2) information; and (3) resources. The three flows are correlated in the research matrix.

Vocational educators were interviewed to determine critical problems in vocational education in Wisconsin. R.C.U. reports and additional literature were reviewed to isolate more potential problems. These problems were edited and used to construct the Research Problems Survey Form. This instrument was sent to administrators in Wisconsin vocational - technical schools; LVEC's; Wisconsin Board of Vocational, Technical and Adult Education staff members; selected Department of Public Instruction staff members, and Steering Committee members.

Major problems identified at the secondary school level related to developing career education programs and related instructional materials, designing effective vocational counseling programs, and identifying valid career decision-making procedures. In the post-secondary VTAE system, emphasis was given to research focused on techniques for determining the need for vocational programs; program, student and staff evaluation; identifying the cost/effectiveness of programs; and developing effective career education programs.

The results of the survey were used in constructing a research matrix. This matrix was developed by a committee comprised of representatives from the VTAE system, LVEC's, DPI and R.C.U. The matrix was reviewed and revised by the project's Steering Committee.

Five major phases were identified for the research matrix. The first phase is concerned with the identification and analysis of needs. Phase II focuses on the design of the systems required to attain the major goal of improved vocational education. Phase III specified research on sub-systems. Research procedures for implementing and integrating new sub-systems with the existing system are included in Phase IV. The last phase is concerned with evaluation.

Introduction

Since the passage of the Vocational Education Act of 1963, a significant amount of money has been available for vocational education research. During this time, many important research programs and projects have been undertaken. Unfortunately, during tnis period of years, there have also been a number of false starts, changes in direction, and budget problems. Goals and priorities have changed in the U.S. Office of Education as new personnel occupied decision-making positions and new administrations have taken office. Late passage of budgets and variations in the amounts appropriated for research from year to year have raised additional problems for researchers. In addition, vocational education has lacked a large cadre of experienced researchers.

As a result of these experiences it has become apparent that there is a definite need for continuity and stability in the vocational education research environment. Also, the need for larger scale research efforts has become more apparent. The individual researcher working on a problem limited to his resources and those of his local administrative unit usually does not arrive at the solutions needed for contemporary problems. Moreover, the various topics pursued by individual investigators are typically unrelated. Thus, although a project may be successfully completed, the findings often have few applications beyond the boundaries of the educational institution in which the problem was studied.

An effective research program requires continuity and additivity. Research goals and priorities must have sufficient clarity and stability to stimulate valid research efforts and insure that projects are completed, replicated, and utilized as building blocks in larger scale research efforts. Successive research studies must build upon the successes and failures of prior studies, and the results of projects in progress at the same time should complement and supplement each other as well as being directed at critical problems. A well planned, coordinated program of vocational education research would be considerably more productive than present planning systems.

Another aspect of the research system which needs attention is the degree to which available research competencies are effectively utilized. The Vocational and Technical Education System in Wisconsin has a number of competent researchers with an intimate knowledge of the problems faced by vocational educators. Another source of researchers is the faculty of the University of Wisconsin System. For example, within the faculty at the University of Wisconsin - Stout resides one of the largest groups of professors found in any university in the United States which is dedicated to the training of vocational and technical education personnel. It would appear that vocational education in Wisconsin has a number of professional personnel who could serve as senior researchers.

Another source of potential researchers is the graduate students enrolled in programs leading to degrees related to vocational education.

These students provide two valuable resources. First, each usually has to complete a research activity of some type in order to attain his advanced degree. In the past, graduate research theses, Plan B papers and dissertations have had varied impacts depending upon the topics investigated. Moreover, each of the studies has tended to have slight, if any, relationship to other graduate research carried out. As a result, these studies, even if done skillfully, usually do not have significant impact on the problems faced by vocational education or education in general. Frequently this lack of impact is a source of discouragement to a graduate student researcher and causes him to question the value of research. Second, graduate students are potential staff members in vocational and technical education programs in Wisconsin. Development of valid research skills in graduate programs and relevant research experiences which lead to an increased interest in research will help to increase the number of vocational personnel who are capable and interested in doing research.

A large number of vocational education research projects are undertaken in Wisconsin each year. It would appear that these research efforts could be more productive and efficient if they could be integrated in a master research plan. In addition, the availability of such a plan would aid in programming graduate research efforts, thus resulting in more effective research training in graduate student programs. As a result, an increased resource of personnel competent to become involved in the research process would be available to vocational education in Wisconsin. The Convergence Planning Technique developed for large scale medical research programs provides a planning technique which could resolve these needs.

Problem

This study was concerned with determining if the Convergence Planning Technique could be applied to vocational education problems in Wisconsin to obtain a valid research plan.

Objectives

The following objectives guided this study:

1. Identify the major problems faced by vocational education in Wisconsin.

2. Determine the overall goal(s) for a convergence plan for vocational research in Wisconsin.

3. Identify the relationships between the overall goal, the problems and the magnitude of the research problems identified.

4. Construct the Convergence Research Plan.

   a. Identify the research logic.

b. Identify the research flows.

(1) Specify the linear research array including the phases, steps and projects within it.

(2) Outline the concurrent research array.

(3) Outline the supplementary research array.

c. Identify the information flow in the convergence plan, especially the communications between the institutions involved in the plan.

d. Identify resources needed to implement the plan.

e. Establish suggested research priorities on the basis of the plan.

5. Determine the possibility of implementing the convergence plan.

6. Identify how various institutions can utilize the Convergence Research Plan.

Framework for the Study

A variety of network planning techniques have been developed to aid in identifying the activities and sequences of activities required to complete a product or project. Critical path analysis and PERT are two examples of more than a score of similar techniques developed in industry. These techniques have proved to be very useful in industry for identifying the logical relationships among the activities and the critical sequence of events. Network analysis and planning have also been widely applied in educational research; however, they have not proved to be as useful in this field as in industry. Network analysis techniques require well-defined activities that can be placed in a logical sequence and carried to completion if sufficient effort is expended. Research frequently involves many unknown or partially defined variables and thus is not totally amenable to network analysis and planning. (This is not meant to infer that network analysis techniques have no applications in research projects. They may be very useful in planning the activities required to complete a specific portion of a larger research project.)

The Convergence Technique was designed to provide a more flexible planning system for research. It was first used in medical research but it has since been applied to education research (Carrese and Baker, 1967; Gephart, 1970). Three general criteria were utilized in developing the Convergence Technique: (1) a logic inherent to the substitive area to be studied must be the basis for planning the general research program, the sub-programs and the specific research activities encompassed in it; (2) since every event in research cannot be known beforehand, allowances

for this tentativeness are necessary; and (3) time specifications for research activities must take into account the fact that research achievements often cannot be scheduled to specific deadlines, thus there is need for flexibility and continuous review of the progress of various research activities rather than immutable deadlines. The Convergence Technique is a process for identifying the components of a major research program and ordering them in a series of planning units which move from general to very specific. The result is a matrix which represents in graphic form a coordinated series of research projects and programs which are also identified with the information and resource requirements needed to initiate and carry them out.

Figure 1 presents an example of the convergence matrix in outline form. The matrix has been partially completed to illustrate each of the components of the plan and to define the linear research array. This matrix was developed to illustrate the Convergence Technique and was not intended to be utilized for research planning without further development. (The research matrix developed in this project is given in Chapter 3.) Figure 1 depicts the three major flows of coordinated activities in a convergence plan: (I) research, (II) information, and (III) resources. In this example the goal was the use of functional tests to assess teaching competencies. The data needed to assess the progress of individual projects to determine the overlaps and gaps in research activities, and manage the overall research program are provided by the information flow (II). The resource flow (III) identifies the personnel, materials, equipment and facilities, and costs associated with each step. When these resources cannot be provided in the total research program modifications have to be made in the research flow. In other words, research activities have to be scheduled on the basis of resources available.

Within the research flow are three separate sub-flows of research activities: (1) linear array, (2) concurrent array, and (3) supplementary array. The linear array defines the main research efforts which are critical to achieving the goal or goals of the total research program. In the example given in Figure 1, the linear array contains the objectives for applied research projects essential to the development and utilization of the competency tests. The linear array is further sub-divided in hierarchical order into phases, steps, and projects. Each phase defines a broad area of research related to the overall program goals. The order of the phases provides a logical sequence of activities and is based upon the general research logic involved in test development. Within each phase more specific areas of research are defined and identified as steps. Note, for example, in phase one in Figure 1 the first step is based on conceptualizing the role of the teacher. Further definition of research activities takes place through the identification of research projects within each step. For instance, several research projects would probably be developed to identify the role of the teacher. Projects investigating the role of the teacher in a differentiated staffing plan, in mediated instruction, individualized instruction, and more traditional instructional systems could be initiated.

			PHASE I: IDENTIFY CONSTRUCTS TO BE MEASURED			PHASE II: DEVELOP INSTRUMENTS			PHASE III. VALIDATE INSTRUMENTS	PHASE IV USE
			Step 1 Conceptualize Role of the teacher	Step 2 Perform Task Analysis	Step 3 Isolate Critical variables in Teaching Performance	Step 1 Select Data collection technique(s)	Step 2 Construct Instruments	Step 3 Pilot	Determine Concurrent, Construct, & predictive validity of instruments	Instruments used for diagnostics, advanced placement and teacher selection
I. Research Flow / Development of Competency Tests	Linear Array		Identify the role the teacher plays in facilitating learning	Distill the tasks performed by vocational teachers and criterion levels of performance	Determine the specific factors that influence teaching performance and define operationally	Identify the techniques that most efficiently and accurately provide data on the variables to be measured	Determine validity of existing instruments; develop additional instruments		Determine reliability and concurrent validity of the instruments.	
	Concurrent Array		Define a theory of teaching	Develop improved task analysis procedures		Determine the effects of matrix sampling on response modes	Identify more precisely the relationship between performance on test items and performance on the job			
	Supplementary Array		Develop new statistics for analyzing task analysis data			Develop new procedures for determining concurrent validity				
II. Information Flow			Director of each project prepares monthly progress reports. Periodic meetings of project directors working on correlated studies			Project directors confer with program director on problems		Program director identifies commonalities between findings from phases and steps		
III. Resources	Personnel		Individuals knowledgeable in learning and teaching processes and research project management							
	Materials		Office supplies, periodicals, books, microforms, etc.							
	Equipment & Facilities		Office space and conference room							
	Cost		Salaries and rental of space							

Figure 1: Partial Convergence Plan for the Development of Competency for the Professional area in Vocational Teacher Training

Since several projects are typically undertaken to attain the objective established for a specific step, the convergence plan provides a variety of opportunities for individual researchers to undertake projects. Moreover, in many instances there will be the need to replicate studies under varying conditions, thus a number of districts and schools can become involved in the research projects associated with a given step in the convergence plan. The Convergence Technique not only allows for a wide-scale participation in research but it provides a basis for coordinating the activities for researchers studying the same or similar problems in several institutions. For example, within the first step in Figure 1, research might be carried out in vocational-technical schools, secondary school systems, CESA's, state-level agencies, and universities. A convergence plan would provide an opportunity to exchange ideas and information and pool the efforts of these researchers.

A basic concept in the Convergence Technique is to focus research activities on the end goal or goals of a specific research program. The process of developing a convergence plan, however, moves from these general goals to somewhat more homogeneous groupings of research activities, which are entitled phases, into steps which are even more specifically defined areas of research activity. In order to attain the goals set for each step, specific research projects are undertaken. In summary, the process is one of differentiating the research activities required to attain the goals of a research program into more specific objectives through the use of phases, steps and projects which are logically sequenced and hierarchically ordered on the basis of research logic associated with the discipline investigated. By using this process the researcher is able to logically define and plan specific research projects which are related to larger program goals. The use of phases, steps and projects organizes the information in the research plan in a manner which does not exceed the information processing capabilities of the human mind. [George Miller has suggested that man's immediate memory span and ability to make comparative judgments is limited to 7 ± 2 dimensions or catagories (1956)]. Application of the Convergence Technique provides relatively few phases to be interrelated and compared. Within the phases the researcher can interrelate the steps. And finally, within a step a set of projects undertaken to attain a common goal can be more easily correlated than in a situation where several hundred research projects might be on-going and somewhat loosely related to the overall goal established for the convergence plan. In other words, research carried out in vocational education has been concerned with improving the quality and delivery of vocational education to the citizens of Wisconsin. However, the task of interrelating these various projects is extremely difficult without some method for organizing them in related research areas.

Research activities and projects that are not considered critical to the achievement of the goals of the total research program are listed in the concurrent and supplementary arrays. However, if time and resources permit, successful completion of these projects will produce valuable inputs for the linear array. Since the linear array is basic to the research program, its sequence and structure (logic) directs the sequence of

activities in the concurrent array. Projects in the supplementary array entail longer-term and higher-risk activities than those in the concurrent array which are more directly correlated with projects in the linear array. The objectives listed in the concurrent and linear arrays and Figure 1 reflect these conditions.

When a convergence plan is designed no consideration is given to existing research findings or projects underway. After the plan has been logically structured, existing research studies are identified and noted on the plan. It is very possible that a step or phase may require little if any additional research. In other words, the goals of the step can be accomplished by utilizing the results of prior studies. For example, the work of Spanbauer (1972) at Fox Valley Technical Institute might provide all or part of the task analysis data needed for step two in phase 1 of the convergence plan given in Figure 1.

After the research arrays have been developed, the information flow can be designed. The function of the information flow is to provide information for the management of the overall research program, major decisions that must be made in relation to the progress of research activities, and interchange of ideas between researchers working on related projects. The information generated will also provide the basis for communiqués concerned with the progress of research and research results which can be distributed to vocational educators.

The last major flow in the convergence plan is termed "resources". This flow is developed after the research and information flows have been identified. As noted in Figure 1 this flow identifies the personnel, facilities and equipment, materials, and money required to accomplish the objectives established in the linear array. The resources flow is divided into the same steps as the linear array. Detailed development of this flow will be dependent upon complete identification of the projects to be carried out in each step and phase of the convergence plan. Thus, it may not be possible to completely identify all of the elements of this flow when the convergence plan is first developed. The attempt to define this flow, however, should identify potential areas of need in terms of personnel and other resources.

Although the Convergence Technique structures an integrated research program, there is still considerable opportunity for the individual researcher and groups of researchers to select and initiate projects of interest to them. The projects within the steps allow flexibility of approach and the concurrent and supplementary arrays provide even greater latitude for the selection of a research problem and research methodology.

Convergence planning is heuristic in that it suggests areas to study and provides the general framework for these studies. Also the convergence plan permits the researcher to see the relevance of his research. It is envisioned that these two characteristics of the Convergence Technique will encourage graduate students to investigate valid and critical problems.

cause their research activities to be more relevant, and bring the sum total of their research activities to bear on large and significant problems in vocational education. Similar effects should be noted in the VTAE system as individual researchers are able to identify the relationship of their project to other ongoing research projects in the system and vocational education.

Vocational educators can use the convergence plan to assist in defining their research problems, aid in identifying related research and help in planning their studies. University staff members may want to investigate specific problems identified in the convergence plan. In addition, they will be called upon to review, summarize and integrate the research findings of graduate students. Also, they will probably be the prime authors of the theoretical research required in the plan. Another area in which they may wish to become involved is in the research identified in the concurrent and supplementary arrays.

Chapter 2

PROCEDURES USED IN DEVELOPING THE RESEARCH MATRIX

Introduction

Two committees, Director's Research Committee and Steering Committee, provided suggestions for the general conduct of this study. These committees also reviewed the results of the Research Problems Survey and the Steering Committee reviewed the Research Matrix. The Matrix Committee helped develop the Research Matrix. Ensuing pages describe the work of these committees and the development of the problems survey.

Committees

Director's Research Committee

The Director's Research Committee was asked to react to the objectives and activities identified in the Convergence Research Project Proposal in October, 1971. Committee members made several suggestions stressing the need for the involvement of VTAE district personnel in identifying the problems and noting the importance of having the Research Coordinating Unit (RCU) manage the Convergence Research Plan which would result from the study. Several questions were raised in regard to the interface between a Convergence Plan that might be developed and local research activities. It was emphasized that the Convergence Technique would appear to provide a framework within which individual projects could be carried out at the district level much the same as in the past. The value of the Research Matrix would be the ability to correlate and plan related studies in order to attack larger problems and provide a basis for greater generalization of research results. At the close of the discussion, the committee asked that it be kept informed of progress of the study and be involved when appropriate.

Late in March, 1972, the director of the Convergence Project met with a sub-committee of the Director's Research Committee to assist in the process of identifying research priorities to be recommended to the VTAE Director's Committee. At this meeting, a summary of the responses from the VTAE system was used in the determination of the most critical problems faced by the VTAE system in Wisconsin. A computer analysis of the magnitude of each problem included in the survey form was made available for the sub-committee members. The print-out also contained a summary of the research priorities identified by the responders. (A copy of the research instrument is reproduced in Appendix C and the summaries of the information collected are given in Appendix D.) On the basis of the results of the survey, research priorities were established and distributed for review by the complete committee. In April, the Director's Research Committee reviewed and discussed the report of the sub-committee. With the exception of some editorial changes, the recommendations for research priorities were approved by the research committee. Later the Director's Committee approved the priorities recommended by

the Director's Research Committee. These priorities were used by the Wisconsin Board for Vocational, Technical and Adult Education during the 1972-73 year.

A Steering Committee was established to assist the project in identifying research problems and priorities, developing the instrumentation, constructing the research design, and reviewing the final research matrix. Members of the committee were identified by Mr. Roland Krogstad, Research Consultant WBVTAE, and the Director of the Convergence Research Project. (A list of the committee members is given in Appendix A.) Members of the committee represented agencies concerned with one or more aspects of vocational education.

The first meeting of the Steering Committee was held on October 29, 1971, in the WBVTAE Office Conference Room. This meeting opened with a review of the project proposal. Next, the convergence technique was described and discussed. After the convergence technique had been explained, the buzz session technique was utilized to identify research problems related to vocational education. More than 50 problems were identified during this session.

The last part of the meeting was devoted to specifying the relationships between the research problems identified. Tentative research phases were established for the problems to further illustrate the Convergence Technique. At the conclusion of the meeting, the participants indicated a willingness to continue serving on the Steering Committee and assisting the project through the identification of problems and resources.

The second meeting of the Steering Committee was held on May 23, 1972. At this meeting, the research matrix developed by the Matrix Committee was reviewed and criticized. (A copy of the agenda for the May 23 meeting is reproduced in Appendix E.) Several modifications in the research logic diagram and research matrix were suggested by the Steering Committee. The research logic diagram and research matrix which appear in this report include the modifications suggested by the Steering Committee. The members of the Steering Committee also made a number of valuable suggestions related to disseminating the results of this project and utilizing them in ongoing research programs. These suggestions will be discussed in more detail in the next chapter. At the conclusions of the meeting, the members agreed that they would like to remain on the Steering Committee and meet again during the next year.

Matrix Generation Committee

Members of the Matrix Committee were selected to represent VTAE schools, Research Coordinating Unit (RCU), Department of Public Instruction, LVEC's and the university system. (The members of this committee are listed in Appendix B.) This committee met on the campus of the University of Wisconsin - Stout on April 18, 19, and 20, 1972. After a review of the Convergence Technique, the committee members were introduced to the results of the Research Problems Survey. The remainder of the first morning was spent

analyzing these results. In the afternoon the committee, with the help of Mehar Arora, Systems Analyst Specialist from the Department of Industrial Management at Stout, developed a research logic diagram for vocational education. The initial step in developing this logic diagram was identification of the overall goal for the Convergence Research Plan. The goal identified was to improve the quality of vocational, technical and adult education programs to better meet the needs of citizens of Wisconsin.

After the research logic had been established, members of the committee turned their attention to development of the linear research array in the Convergence Matrix. Most of the remaining two days were devoted to this task. Each committee member picked a subsystem from the research logic system and analyzed it into phases, steps, and projects. As projects were identified, they were noted on 4" x 6" cards and placed in appropriate sequence on a large convergence chart mounted on the walls of the conference room. After all of the phases and steps had been identified, the relationships between them were studied. The sequence of research activities was adjusted on the basis of this review. After the meeting had adjourned on April 20, the project director spent approximately one week synthesizing the work of the committee members. The results of the efforts of the committee and the synthesis is presented in the research matrix reproduced in Chapter 3.

Before concluding the matrix material, the members of the committee discussed the information and resources flows. Much of the discussion was given to the flow of information related to research problems and projects. Committee members concurred that the RCU should be the central agency disseminating information of research on problems related to vocational education in Wisconsin. It was noted that the responses to the Research Problems Survey will provide information on individuals concerned with specific research problems. This will help in communications and will also identify resource people for various projects. Committee members felt that final determination of the resources flow will have to be based upon specific projects proposed within steps in the research matrix, and that they should not attempt to do this.

Identification of Research Problems

The Director of the Convergence Project met with the assistant directors for instructional services and the assistant directors for research and planning in the VTAE districts in Wisconsin. At each meeting, the VTAE administrators were asked to identify the major problems with which they were faced. These meetings were conducted during November and December, 1971, and January and February, 1972. Approximately one-half day was spent at each of the vocational-technical schools.

During the course of the project, the director also worked with the Center for Vocational, Technical and Adult Education. A number of LVEC's were contacted through the Center. During these meetings, the researcher had an opportunity to identify a number of problems of concern to the LVEC.

During the initial phase of the project, it had been planned that the director would meet with the LVEC's during their winter meeting in Wisconsin Dells. However, this meeting had to be cancelled by DPI because of a conflict.

During the time the project director was meeting with VTAE personnel and LVEC's the project research assistant was reviewing RCU quarterly reports, WBVTAE problems lists, research reports, and journal articles to derive additional research problems. Each problem encountered was placed on a tab card. The project research assistant also processed the results of the interviews conducted by the project director and placed the problems identified on tab cards. Approximately two thousand problem statements were accumulated through this process.

Development of the Survey Instrument

The problem statements generated through the review of literature and meetings with vocational educators were used to develop the survey instrument. The cards were first sorted into piles of identical problem statements. For example, a number of identical problem statements were recorded for the need to obtain valid job market data. All of these statements were replaced in one pile or category. After all of the identical statements had been identified, the problems were reviewed to determine more homogeneous problem areas encompassing sub-sets of several similar problems. As a result of this process, sixteen problem areas were established.

Problem statements were developed for the sixteen problem areas. Next a representative sample of specific research problems was selected for each of the problem areas. In order to keep the instrument to a practical length, an attempt was made to present as few statements as possible for each problem area and still maintain a representative sample. Approximately five blank spaces were provided in each problem area so the responder could identify additional problems of concern to him. This allowed the researcher to identify problems which had not been included in the original list and guarded against the omission of one or more critical problems during the process of developing the survey instrument.

Two response continuums were established for each item in the survey instrument. On the first, the responder was asked to identify the magnitude of the problem in his district, school or unit. Values on this scale ranged from 1, "Problem Does Not Occur", to 7, "Very Critical Problem". Very critical problems were defined as those which had significant impact on meeting the objectives of the vocational programs in the responder's district or school. The instructions directed the responder to use a rating of "7" for the four or five most critical problems in his educational agency. Responders were also asked to identify when research was needed on these problems. Three response categories were provided. Responses were (1) within one year, (2) between one to five years, and (3) six years and over. (A copy of the survey instrument has been reproduced in Appendix C.) These two response continuums were used to identify the magnitude and the suggested priority for research for each problem. No doubt there is considerable overlap

between these two sets of responses; however, the magnitude readings provide a basis for including the problem area in the Convergence Matrix and the priority ratings suggest when research should be initiated.

The original draft copy of the survey instrument was piloted with instructional services, research and planning, Steering Committee, and WBVTAE staff members. As a result of their comments, the original response continuum for magnitude was increased from 5 to 7. Since the problems had already been screened and had importance to vocational education, a continuum of 5 was not large enough. Very few responses were received below a moderate level (3) of importance. Thus, with a scale of 5 the responder could only choose from 3, 4, and 5 in most instances. Increasing the scale to 7 added another response position beyond "moderate." Responses on the final survey indicated the 1 to 7 scale worked effectively. After piloting the instrument, revisions were made and the instrument was reproduced.

Populations Surveyed

Several groups involved with vocational education in Wisconsin were included in the problems survey for the Convergence Project. An attempt was made to include vocational educators with special knowledge and acquaintance with the problems of vocational education.

The following groups were included in the survey:

1. VTAE System
    - 1.1 Directors of each of the vocational-technical districts
    - 1.2 Assistant directors for instructional services in VTAE districts
    - 1.3 Assistant directors for research and planning in VTAE districts
    - 1.4 Assistant directors for student services in VTAE districts
    - 1.5 Members of WBVTAE staff
2. Secondary System
    - 1.1 All local vocational education coordinators
    - 1.2 Members of the Career and Manpower Development Department at DPI
3. Steering Committee

Chapter 3

DEVELOPING THE CONVERGENCE RESEARCH PLAN

Survey Results

As noted in the previous chapter, the research problems survey instrument was developed on the basis of interviews conducted with vocational educators and a review of literature concerned with problems in vocational education. The first draft of the instrument was piloted and revised before being reproduced in final form. The survey was mailed in February, 1972. Responses to the initial mailing were excellent. A follow-up letter was mailed to non-responders approximately two weeks after the initial mailing.

Response Rates

Table 1 presents the response rates for each of the populations surveyed. More than 80 percent of the survey forms mailed to the VTAE System were completed and returned. The directors' returns are lower than the other populations surveyed within the VTAE System. However, several of the directors noted that they were asking their research and planning administrator to complete the survey form for them. Thus, the percentage of response for the directors underestimates their input to the survey.

Returns from the secondary system ran slightly lower. However, the LVEC group is considerably larger than any of the other populations surveyed, and the project did not have the number of direct contacts with them it had with the VTAE personnel. Thus, the 68 percent response rate reflects a good response rate from this population.

Since the summaries of responses to the survey were done in May, the project has received some additional returns. (See Appendix D for the summaries.) The one instructional services administrator who had not returned a form as of the time of the summary, returned his form. One additional student services person has also completed and returned his form. In addition, five more LVEC's returned their form. Because of the time required to reprocess the summary tables on the computer and the fact that one or two returns would have slight effect on the summary statistics, the decision was made not to rerun the summaries. These returns will be keypunched and placed with the rest of the cards for use in the information retrieval system.

Validity

Information collected on the survey form appeared to be valid. A concerted attempt was made in the process of collecting and stating the problems to make the form content valid. Data collected through discussions with VTAE administrators indicated that three basic problem areas of concern were (1) determining the need for vocational - technical

Table 1

Response Rates to Vocational Research Problems Survey

Population	N	Percent Return
VTAE System		
Directors	17	59
Instructional Services	17	94
Research & Planning	17	100
Student Services	17	82
WBVTAE Staff	15	80
Secondary System		
LVEC's	154	68
DPI Staff	10	60
Steering Committee	13	62

programs, (2) developing programs for students with special needs, and (3) program evaluation. Responses on the survey instrument revealed the same areas of emphasis.

Another check on the validity of the data collected was through its use in determining the priorities established for research in the VTAE System during the 1972-73 year. A sub-committee of the Director's Research Committee reviewed the summary of responses from the VTAE System and on this basis suggested a list of research priorities for the coming year. This list was passed with some editorial changes by the Director's Research Committee and was later approved by the Director's Committee. From evidence collected by the project it would appear that the problems included in the survey instrument were valid.

Reliability

The length of the survey has caused some concern for the reliability of the responses to the instrument. A review of the medians for each of the problems in the survey instrument revealed no response pattern which would indicate that the responders were not reacting to each of the

problem statements. In other words, there was no consistent decline or increase in the medians in the middle and latter part of the instrument. In fact, the response patterns varied throughout the survey instrument and the problems identified as having the largest magnitude came from various segments of the instrument.

Another check on the reliability of the responses is the correlation between items concerned with problems in the same or similar areas. It would be expected that the correlations between these items would be positive and statistically significant. Table 2 presents the correlations for the responses of the research and planning administrators to selected items in the research problems survey instrument. All of the correlations are positive and statistically significant, thus suggesting a consistent pattern of response to the items.

Table 2

Correlations between Selected Items for the Responses of VTAE Research and Planning Administrators

Items	Correlated	Content of Items		
		First	Second	r
1	12	Need for V-T programs	Ident. appropriate programs for school	.72
1	14	Need for V-T programs	Determining feasibility of a program	.87
13	20	Selecting relevant content	Providing relevant general education	.67
58	87	Assessing relationship of student charact. to success in occupation-al programs	Developing programs that meet the need of the handicapped	.76
58	162	Assessing relationship of student charact. to success in occupation-al programs	Developing a bank of information for planning decision-making	.76

Major Problem Areas and Problems

Each recipient of a survey instrument was asked to rate the problem area and problems based on his assessment of the magnitude of the problems in his district, school or unit. Responses to the survey were summarized by

population. Medians and interquartile ranges were computed for the responses by each population on each item on the survey. The median reflects the typical level of response to a given problem. The inter-quartile range provides an indicator of the level of agreement in each set of responses. (The inter-quartile range indicates the number of score intervals required to band the center 50 percent of the responses.) The medians can be used in two ways in analyzing the survey responses. First, they can be compared to the scale values used in the survey instrument. For example, a median of 6.5 on the magnitude rating would indicate that one-half of the responders had checked "7" (very critical). Second,medians for the several groups surveyed can be contrasted to determine the relative magnitude of a problem as perceived by each group. A complete summary of the medians and inter-quartile ranges for the groups surveyed is presented in Appendix D.

Ranking of Problem Areas

The median rating given each problem area by each of the groups surveyed is given in Table 3. The rank order of the medians in each group is also given. A review of the data in Table 3 indicates considerable variability in the ratings given each of the problem areas by the seven populations involved in the research problems survey. Illustrative of this variability is the range of ranks found for problem area 1, which is concerned with determining the need for vocational - technical programs. In problem area 1 the rank of the medians ranged from "1", largest magnitude, to "16", smallest magnitude. The average rank was 7.9.

A review of the responsibilities of the individuals in each of the populations reveals a high correlation between the responsibility of the responder and the problem areas rated as being of high magnitude. In other words, the responder gave the highest ratings to those problems associated with his function. As a result, averages or average ranks of problem areas are not too meaningful in making decisions on the magnitude of problems in vocational education in Wisconsin. Rather, one must look at the composite picture presented in the ranks for each population surveyed. This mosaic more accurately represents the magnitude and scope of vocational education research problems in Wisconsin.

Four separate problem areas: (1) determining the need for vocational-technical programs; (2) program and curriculum development; (3) evaluating programs for students and staff; and (4) maintaining an effective public relations program - received a rank of "1", or in other words, were identified as the most critical problem area by one of the groups in the survey. In addition, the VTAE instructional services administrators had four areas which attained the same high median rating (5.50). These problem areas included creating effective administrative procedures and structures; identifying and allocating resources; planning, obtaining and utilizing facilities and equipment; and making valid decisions and plans. The disparity in the ranking of problem areas suggests that decisions made related to a research program will have to be based upon the needs of each specific group surveyed instead of being based on the average ranks or a composite summary of the data.

Table 3
Rank Order of Problem Areas for Each Population Surveyed

Problem Area	Directors	Instruct. Services	Research & Plan.	DPI	LVEC	WBVTAE	Steering	Average Rank
1	4.50(16)#	4.50(10.5)	6(1)	6.83(1)	4.60(11)	5.75(12.5)	5.25(3.5)	7.9
11	6(1)	4.33(13.5)	4.20(16)	5.50(11.5)	5.10(4)	6.83(1)	4.16(13)	8.5
33	5(10.5)	5.30(5)	5.(5.5)	6.(5.5)	4.73(10)	6.00(9)	4.50(6.5)	7.4
45	5.5(3.5)	4.00(16)	5.(5.5)	5.50(11.5)	5.70(1)	6.00(9)	4.50(6.5)	7.6
58	4.90(13)	4.66(9)	4.75(12)	5.25(14)	4.92(6)	5.33(15.5)	4.25(11)	11.5
68	5.(10.5)	4.33(13.5)	5.(5.5)	4.50(16)	4.34(15)	6.50(5)	3.83(15)	11.5
77	5.16(6)	5.00(7)	5.12(3)	5.87(7)	5.11(3)	6.80(2)	5.25(3.5)	4.5
87	4.83(14)	4.50(10.5)	5(5.5)	6.25(3.5)	4.56(12)	6.60(4)	5.00(5)	7.8
95	5.12(7)	5.25(6)	4.8(10.5)	6(5.5)	4.97(5)	6.75(3)	4.25(11)	6.9
108	5.1(8)	4.89(8)	4.85(8)	6.50(2)	5.20(2)	6.23(7)	5.5(2)	5.3
117	5 83(2)	5.50(2.5)	4.8(10.5)	4.75(15)	4.55(13)	5.75(12.5)	4.25(11)	9.5
127	5.00(10.5)	4.33(13.5)	4.66(13.5)	5.75(8)	4.45(14)	6.00(9)	4.37(8)	10.9
137	4.75(15)	5.50(2.5)	4.5(14)	5.50(11.5)	4.85(8)	5.83(11)	4.33(9)	10.1
147	5.25(5)	5.50(2.5)	5.83(2)	5.66(9)	4.88(7)	5.33(15.5)	2.25(16)	8.1
157	5.50(3.5)	5.50(2.5)	4.25(15)	5.50(11.5)	4.27(16)	6.25(6)	4.00(14)	9.8
167	5.00(10.5)	4.33(13.5)	4.83(9)	6.25(3.5)	4.82(9)	5.50(14)	6.00(1)	8.6

First number is the median response for the problem area. Second number ( ) is the rank of the median.

Major Problems

After the summaries of the responses had been run, a frequency chart was developed to display the frequency of occurance of medians of various magnitudes found in the survey. This table is reproduced in Appendix D. The information in this chart was used in identifying the major problems identified by each population in the study. Table 4 presents the major problems and their median rating for each population in the study. Again, the influence and perspective supplied by the responsibilities and tasks encompassed in the job of the responder are in evidence. Directors of VTAE schools, for example, placed the most emphasis on problems concerned with decision-making, identification and development of new programs, and the evaluation of staff. Although there were some common problems, the VTAE instructional services administrators gave more emphasis to defining the role of the teacher in new instructional settings, providing appropriate learning activities and materials, and developing learning activities that are effective with disadvantaged students.

Research and planning administrators in the VTAE system were more concerned with the problems associated with determining the occupational training needs of the people in their districts; identifying the costs, benefits, and effectiveness of their programs; and determining the manpower needs for their area and region. Student services administrators in the VTAE system received an abbreviated form containing those items related to their function. Career education, career decision-making procedures, and learning activities that are effective with the disadvantaged received the highest ratings. Staff members at the Wisconsin Board of Vocational, Technical and Adult Education placed most emphasis on problems concerned with providing appropriate in-service experiences for VTAE staff members, initiating services and programs for the disadvantaged, and developing a better image of vocational - technical education.

Local vocational education coordinators (LVEC's) placed greatest emphasis on the problems concerned with career education and career decision-making. Similar problems were rated high by the staff of the Career and Manpower Development staff in DPI. In addition, the DPI staff members indicated that obtaining valid job market data, planning facilities, and articulating programs with post-high school institutions were also major problems. Members of the Steering Committee rated selecting and training students to work with the disadvantaged as the most critical problem. Developing a better image of vocational education was also given high emphasis. Other problems of importance were concerned with designing an ongoing public relations program, obtaining valid job market data, and designing an articulated K through adult career education program.

Some common problems are found among the major problems identified by each group. However, there are also a number of unique problems in each group. This phenomenon was observed throughout the survey instrument. Table 5 presents the correlation coefficients for each contrast for the relationships between the median ratings assigned to the problems and problem areas by each population. If two groups assigned the same magnitude to each problem in the survey or the rank order of the magnitudes were the same, the correlation coefficient would be 1. The correlation

Table 4

Major Problems Identified by Each Population Surveyed*

Population (Problem)	Median Magnitude
VTAE Directors	
Using research data in decision-making	6.50
Working with accrediting agencies and associations in the development and approval of new programs	6.25
Designing and using valid staff evaluation procedures	6.16
Utilizing evaluation data in decision-making	6.00
Obtaining research data needed in decision-making	6.00
Planning facilities that facilitate learning	6.00
Selecting the information and techniques needed in decision-making	6.00
VTAE Instructional Services Administrators	
Defining the role of paraprofessionals	6.21
Specifying the role of the teacher in new instructional systems	5.92
Determining the costs, benefits and effectiveness of our proposed programs	5.90
Planning facilities that facilitate learning	5.83
Providing learning activities and materials that are appropriate for the learning style of the individual	5.83
Developing learning activities that are effective with the disadvantaged	5.83
VTAE Research and Planning Administrators	
Determining the occupational training needs of the people in our district	6.20
Determining the costs, benefits and effectiveness of our present programs	6.00
Obtaining valid job market data	5.85
Developing long-range plans	5.83
Forecasting manpower requirements for our area and region	5.71
VTAE Student Services Administrators	
Identifying career decision-making procedures that lead to valid career selection	6.20
Relating career education concepts to the developmental stages of students	6.08

*Approximately the five problems with the largest medians. In cases of ties, there will be more than five.

Table 4 continued - Major Problems Identified by Each Population Surveyed

Population (Problem)	Median Magnitude
Developing learning activities that are effective with the disadvantaged	6.08
Integrating career development concepts with present courses and programs	6.00
WBVTAE Staff	
Providing appropriate in-service experiences for our administrative staff	6.83
Initiating services that assist the disadvantaged in successfully completing occupational programs	6.75
Selecting and/or training staff to work with the disadvantaged	6.75
Determining the competencies our staff members need to develop	6.75
Developing a better image of vocational - technical education	6.71
LVEC's	
Designing an articulated K through adult career education program	6.50
Integrating career development concepts with present courses and programs	6.29
Designing more effective vocational counseling programs	6.28
Identifying career decision-making procedures that lead to valid career selections	6.19
Relating career education concepts to the developmental stages of students	5.96
Developing a more effective placement program	5.81
DPI Career and Manpower Development Staff	
Designing an articulated K through adult career education program	6.75
Obtaining valid job market data	6.75
Identifying career decision-making procedures that lead to valid career selections	6.75
Planning facilities that facilitate learning	6.75
Articulating our programs with those in which our students enroll after completing our programs	6.66

Table 4 continued - Major Problems Identified by Each Population Surveyed

Population (Problem)	Median Magnitude
Steering Committee	
Selecting and/or training staff to work with the disadvantaged	6.50
Developing a better image of vocational - technical education	6.16
Designing an ongoing public relations program	6.00
Obtaining valid job market data	6.00
Designing an articulated K through adult career education program	6.00

Table 5

Correlations Between Median Ratings for the Magnitude of Problem Areas and Problems in the Research Problems Survey Instrument

	Group						
	VTAE System				Secondary System		
Group	Directors	Instructional Services	Research & Planning	WBVTAE	LVEC	DPI	Steering Committee
Directors	--	.32	.25	.18	.13	.04	.12
Instructional Services		--	.31	.20	.10	.10	.12
Research & Planning			--	.22	.24	.14	.39
WBVTAE				--	.34	.30	.37
LVEC					--	.48	.49
DPI						--	.45
Steering							--

Correlations .20 and larger are significant at the .05 level.

coefficients in the table indicate slight to moderate levels of agreement in the ratings assigned to each problem and problem area. As noted at the bottom of the table, any correlation of .20 or larger is statistically significant at the .05 level. In other words the relationship displayed by the correlation coefficient would occur 5 percent or less of the time by chance.

It is interesting to note that the highest correlations tend to be between groups within the same system. For example, the directors' responses correlate more highly with those of the instructional services administrators, research and planning administrators and WBVTAE staff than they do with those of the LVECs and DPI staff. Similarly the LVECs' responses correlate more highly with the responses from the DPI staff members. These results suggest that each system faces some unique problems.

1972-73 Research Priorities for the VTAE System

Responses on the research problems survey instrument from the VTAE System were used in establishing recommended research priorities for the VTAE System. The director of the Convergence Research Project met with a sub-committee of the Director's Research Committee in La Crosse, Wisconsin at the end of March, 1972, to review the summaries of responses from the survey. Five summaries were presented to the sub-committee: (1) directors; (2) instructional services administrators; (3) research and planning administrators; (4) WBVTAE staff members and (5) composite summary encompassing the members of the four groups.

After reviewing the summaries of the survey responses, the sub-committee developed the following recommended priorities for consideration by the Director's Research Committee:

1. Determining the need for vocational - technical programs with an emphasis on obtaining valid job market data, forecasting manpower requirements and determining occupational training needs for people in the district.

2. Determining the need for programs and services to meet the needs of disadvantaged students.

3. Developing effective career education programs with an emphasis on designing an articulated K through adult career education program.

4. Evaluating programs, students and staff with an emphasis on designing valid staff evaluation procedures and utilizing evaluation data and decision-making.

5. Creating effective administrative procedures and structures.

6. Evaluating the effectiveness of learning activities and materials.

7. Special problems that received high ratings and were recommended for high priority were

   a. Developing flexible entry points to programs.
   b. Encouraging staff members to utilize research data.
   c. Determining costs, benefits and effectiveness of vocational - technical programs.
   d. Identifying the need for new facilities to local voters.
   e. Developing a more effective placement program.

The Director's Research Committee reviewed the priorities identified by the sub-committee. With the exception of slight editorial changes, the Research Committee accepted the recommendations of the sub-committee. These recommendations were forwarded to the Director's Committee for their action. The Director's Committee approved the priorities as identified by the Research Committee.

Development of a Research Matrix

As described in Chapter 2, the research matrix was developed by a committee comprised of vocational educators, the project director and a specialist in systems analysis techniques. The starting point in constructing the research matrix was the identification of the research logic inherent to problems in vocational - technical education. The first step in developing research logic was the definition of the end goal for the research matrix. The goal identified by the committee was to "improve vocational, technical and adult education programs to better meet the needs of the citizens of Wisconsin". With this goal as a guide, the research logic system graphically depicted in Figure 2 was developed.

Since the end goal of the research matrix focuses on new and improved programs, the central sub-system in the research logic system was the instructional sub-system. A logical analysis was used to relate other sub-systems in the total research logic system to the instructional sub-system to enhance the development of the instructional sub-system.

In the research logic system depicted in Figure 2, the first step in developing a new program or refining an existing program is to determine the need for the program. After this has been done, program and curriculum development activities can be initiated. In the process of program and curriculum development, there is a need to assess the needs of the people to be served by the program and to determine the student characteristics that are related to success in the program. Included in these two sub-steps are the research efforts required to identify the needs and characteristics of special student groups such as the disadvantaged and handicapped.

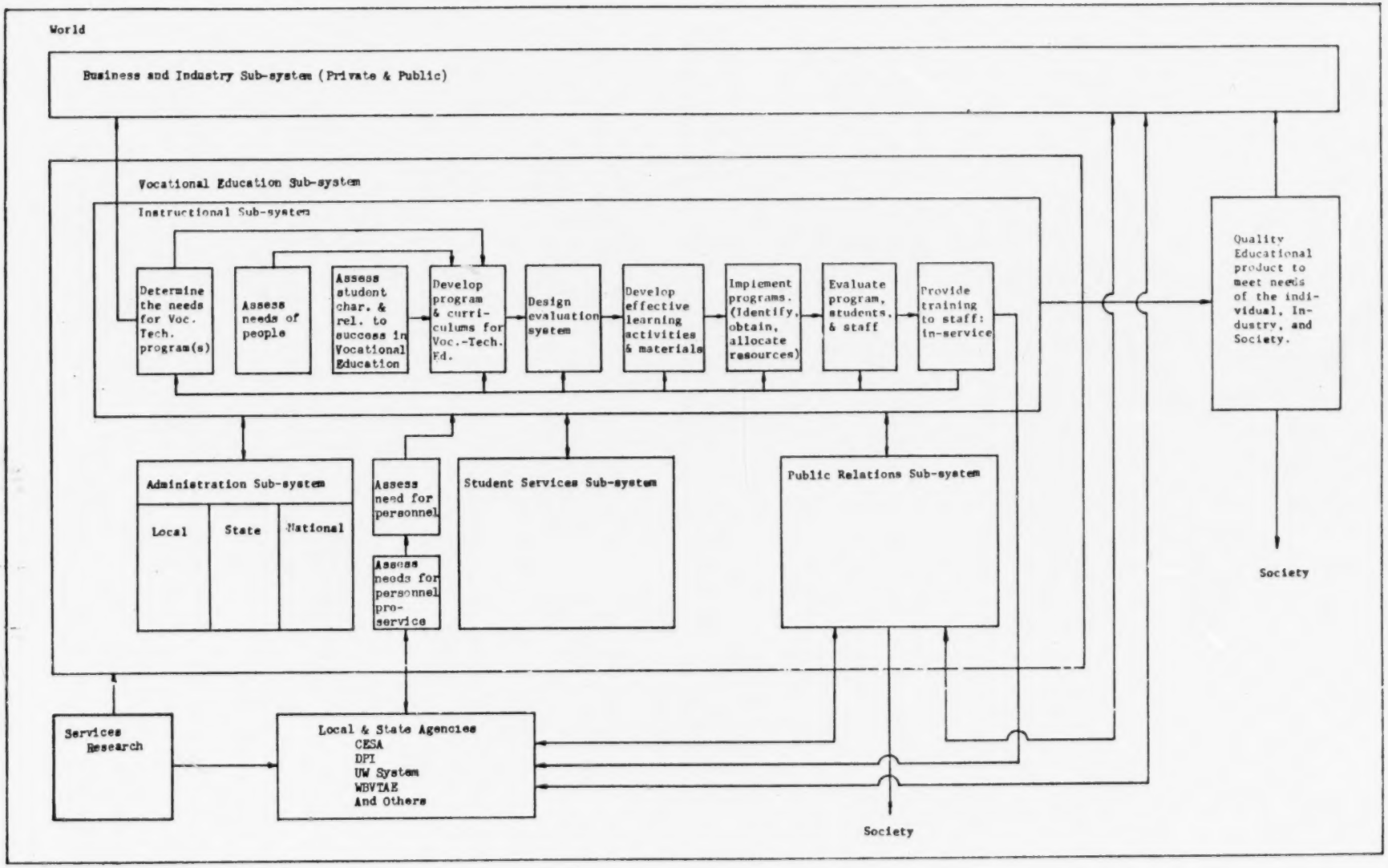

Figure 2: A Research Logic System for Vocational - Technical Education

The committee felt that the evaluation system to be used in concert with a program should be designed in the early stages of program development. Thus, the design of the evaluation system is the next element in the instructional sub-system. This evaluation system would be concerned with collecting both process and product data.

The next element in the instructional sub-system is concerned with the development of effective learning activities and materials. These activities and materials would be designed and constructed to attain the objectives distilled in the program and curriculum development phase. After the learning activities and materials have been developed, the program is ready for execution. Considerations involved in implementing a program include the identification and procurement of the fiscal and facility resources required for the program. Implementation also includes conducting the program.

Evaluation data need to be collected as students progress through and complete the program. As mentioned previously, the evaluation data include information on students, staff and program elements. This information provides the basis for developing an in-service training program for staff, revision of the program, and validation of program development decisions. As noted by the element to the right of the instructional sub-system which links the output of the vocational education instructional sub-system to the society and the business and industry sub-systems, the criteria for judging the educational product will be concerned with the degree to which the products of the instructional sub-system meet the needs of society, business and industry. The efficiency of the instructional sub-system will also be of concern.

The vocational education sub-system also includes three other sub-systems: (1) administration, (2) student services and (3) public relations. These sub-systems are connected with the instructional sub-system to show their ancillary role. In other words, their function is to maximize the operation of instructional sub-system.

Three additional elements are presented in the research logic system. These are external to the vocational education sub-system. Several local and state agencies concerned with the pre-service and in-service training of personnel for the vocational education sub-system are included in one element. For example, the University of Wisconsin System has a number of pre-service programs which develop personnel for the vocational education system. Thus, the UW System needs to be informed of the personnel needs of the system. In addition, the UW System conducts a number of educational experiences for the in-service training of staff. In order to make these experiences relevant, the university system must be aware of the needs of vocational educators.

Local, state, and other agencies also provide additional services for the vocational educational system. An example of one of these services is research. The nature and progress of vocational education is critical to sustaining and improving society in Wisconsin. Society has two roles in the research logic system depicted in Figure 2. First, vocational programs are evaluated on the basis of the degree to which they meet the needs of

society. Second, a public relations sub-system is included as a vehicle to provide Wisconsin citizens with information on vocational - technical education.

The sub-systems, elements, and interrelationships depicted in the research logic system in Figure 2 reflect the steps and activities required to identify, develop and initiate effective vocational education programs. This system was identified on the basis of a logical analysis of the activities required to develop and offer vocational programs. It does not imply that research is needed in each of the areas, nor does it suggest the magnitude of research required. The data collected in the research problems survey provide this information.

After the research logic system had been developed, the committee reviewed the results of the survey. Based on the magnitudes and priorities assigned to the problem areas and problems by the responders and the structure of the research logic system, the linear research array was divided into 11 subflows. Table 6 presents in the subflows in the linear research array. (As discussed in Chapter 1, the linear array of the research matrix contains the research actives considered to be essential to attaining the end goal of the research matrix.)

Table No. 6

Subflows in the Linear Array of the
Research Flow in the Research Matrix

Subflow No.	Content
1	Design, development and implementation of programs and instruction
2	Evaluation
3	Student characteristics related to success in occupational programs
4	Relationship between learning conditions and instructional materials and the acquisition of vocational skills
5	Program and curriculum development procedures and models
6	Decision-making models for vocational education
7	Administration
8	Public relations
9	Dissemination
10	Student services
11	Professional development

As noted previously, each subflow was developed by a committee member and then integrated into the total research matrix. The process of integration included a review by the entire committee and a synthesis by the project director.

The results of these activities are represented in Figures 3 through 7. When reviewing the research matrix, the reader must remember that it is developed on the basis of the research logic inherent to the discipline or field and does not take into consideration, during the design phase of the matrix, research which has already been completed. Hence, there are some areas in which the reader may feel that sufficient research knowledge already exists. This may very well be true; however, in the design of the matrix, the major emphasis is on the development of a logical research plan. Rather than run the risk of omitting a step or sub-step based on the judgment of the adequacy of research in the area, it is placed in the matrix. After the matrix has been completed, the status of research in each phase and step can be determined. If there are steps in which sufficient research has been carried out, these can be given less emphasis in future research priorities. Responses to the research problems survey conducted with vocational educators indicate the magnitude of research problems at the practitioner's level. A review of research completed will reveal the scope and quality of data available to resolve these problems. If a large volume of research has been carried out in one of the steps identified in the research matrix, the major research activity required may be a synthesis of these research studies. After the synthesis has been completed, the major task may be one of dissemination and application to the problems of the practitioner.

Because of the size of the linear array developed in this study, the entire matrix cannot be presented in one figure. Each of the five phases in the linear array is presented in a figure. Figure 8 presents a graphic outline of the phases, steps, and flows encompassed in the total research matrix.

Phase I

Phase I in the linear array is concerned with the analysis of needs. The objective for this phase is to "determine the need for vocational and technical education in Wisconsin, assess the present status of occupational education including the types of programs offered, populations served and problems encountered." Figure 3 presents the three steps and the subflows in Phase I of the linear array in the research flow. Step 1 in Phase I is concerned with identifying the need for vocational programs. Both societal and manpower needs are included in the subflows. In addition, this step encompasses the design of the evaluation system to be utilized throughout the research matrix and an assessment of the impact of federal, state and local decisions on vocational education.

Step 2 in Phase I focuses on identification of the current output and status of vocational - technical programs and support services. The central subflow in Step 2 is concerned with the determination of present status, needs and outcomes of vocational education. The subflows are

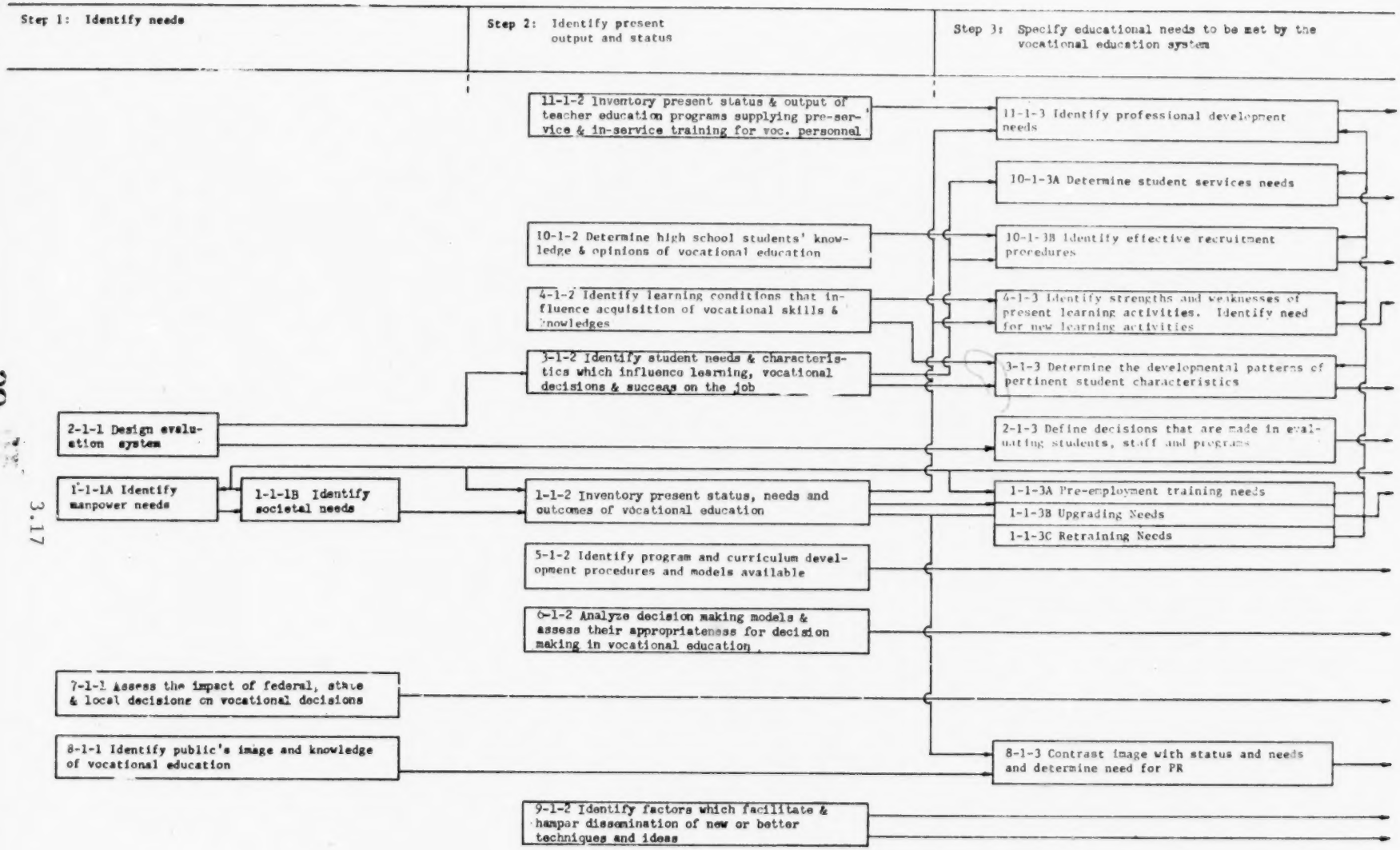
Step 1: Identify needs
Step 2: Identify present output and status
Step 3: Specify educational needs to be met by the vocational education system
11-1-2 Inventory present status & output of teacher education programs supplying pre-service & in-service training for voc. personnel
11-1-3 Identify professional development needs
10-1-3A Determine student services needs
10-1-2 Determine high school students' knowledge & opinions of vocational education
10-1-3B Identify effective recruitment procedures
4-1-2 Identify learning conditions that influence acquisition of vocational skills & knowledges
4-1-3 Identify strengths and weaknesses of present learning activities. Identify need for new learning activities
3-1-2 Identify student needs & characteristics which influence learning, vocational decisions & success on the job
3-1-3 Determine the developmental patterns of pertinent student characteristics
2-1-1 Design evaluation system
2-1-3 Define decisions that are made in evaluating students, staff and programs
1-1-1A Identify manpower needs
1-1-1B Identify societal needs
1-1-2 Inventory present status, needs and outcomes of vocational education
1-1-3A Pre-employment training needs
1-1-3B Upgrading Needs
1-1-3C Retraining Needs
5-1-2 Identify program and curriculum development procedures and models available
6-1-2 Analyze decision making models & assess their appropriateness for decision making in vocational education
7-1-2 Assess the impact of federal, state & local decisions on vocational decisions
8-1-1 Identify public's image and knowledge of vocational education
8-1-3 Contrast image with status and needs and determine need for PR
9-1-2 Identify factors which facilitate & hamper dissemination of new or better techniques and ideas

Figure 3: Linear Array - Phase I: Identification and Analysis of Needs

concerned with identifying the status of programs that prepare vocational personnel, curriculum development procedures, student characteristics and learning conditions that influence the acquisition of vocational skills.

Step 3 in Phase I focuses on the specification of the needs to be met by the vocational educational systems. These needs will be based upon the data collected in Steps 1 and 2. Information from Step 1 will identify the programs needed in Wisconsin. Any discrepancies existing between the current output of vocational programs found in Step 2 and the needs identified in Step 1 will suggest the need for new and/or revised programs. Step 3 also includes research activities to identify professional development, student services, and public relations needs. In addition, research activities in the area of instructional materials and learning activities are also defined. Before going to the next phase, a short discussion describing the numerical codes used in the Figures 3 through 7 will be presented to assist the reader in interpreting the figures. Each element (enclosed in a box) listed in a research subflow contains a numerical code. The first digit of this code indicates the subflow number. The second digit represents the phase number. And, the third digit indicates the step number. If two groups of research activities are specified within a given subflow and step, a suffix letter is added to identify the two groups. To illustrate this, consider the first block of research activities specified in Phase I, Step 1, for the program development subflow. The numerical code is 1.1.1A. This indicates that the the "identification of manpower needs" falls within the program development subflow (1) in Phase I (1-1), in Step 1 (1-1-1), and is the first (1A) of two areas of research activity specified.

Contingencies between the research activities are indicated by the flow chart lines. Thus, for example, the "inventory present status, needs and outcomes of vocational education: 1-1-2" is depicted as being dependent upon the identification of manpower needs (1-1-1A) and the identification of societal needs (1-1-1B). When studying the present status, needs and outcomes of vocational education the researcher would have to be concerned with manpower and societal needs in order to obtain data for decisions related to the degree to which the output of present vocational - technical programs satisfied manpower and societal needs. Similarly, the identification of professional development needs for vocational educators (11-1-3) is based on the research in Step 1-1-2, inventory present status and needs of vocational education, and on the specification of educational needs coming from the research activities in Block 1-1-3A, B and C.

Phase II

Phase II in the linear array of the research matrix is entitled "Systems Design (Planning and Development)". The objective for Phase II is to identify the elements and their relationships involved in improving the quality and scope of occupational education, and to use these as a basis to design a system to achieve the end goal of the research matrix. Five steps are encompassed in this phase. (See Figure 4) The initial step is concerned with research directed to refining the variables identified

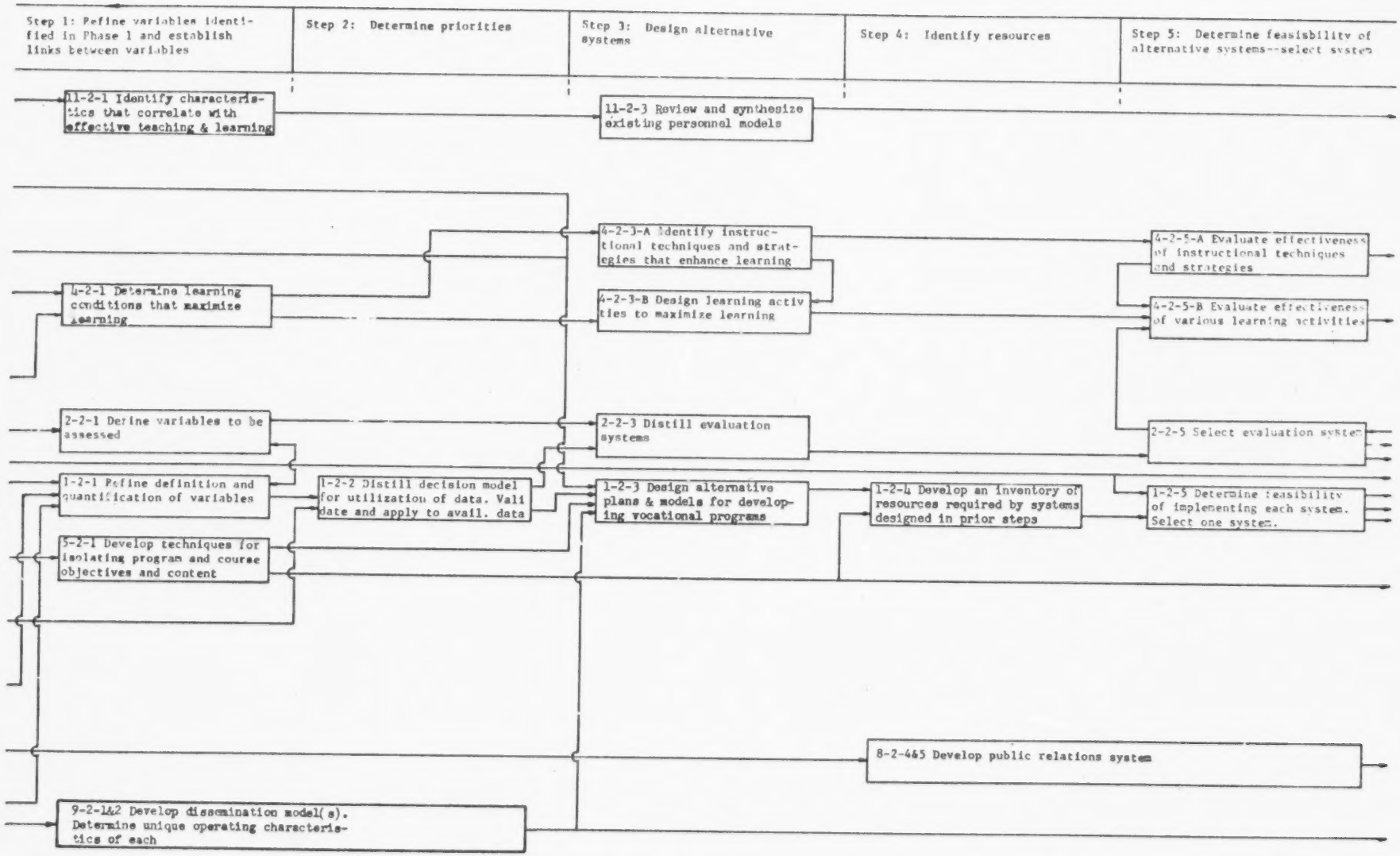
Step 1: Refine variables identified in Phase 1 and establish links between variables
Step 2: Determine priorities
Step 3: Design alternative systems
Step 4: Identify resources
Step 5: Determine feasibility of alternative systems--select system
11-2-1 Identify characteristics that correlate with effective teaching & learning
11-2-3 Review and synthesize existing personnel models
4-2-3-A Identify instructional techniques and strategies that enhance learning
4-2-5-A Evaluate effectiveness of instructional techniques and strategies
4-2-1 Determine learning conditions that maximize learning
4-2-3-B Design learning activities to maximize learning
4-2-5-B Evaluate effectiveness of various learning activities
2-2-1 Define variables to be assessed
2-2-3 Distill evaluation systems
2-2-5 Select evaluation system
1-2-1 Refine definition and quantification of variables
1-2-2 Distill decision model for utilization of data. Validate and apply to avail. data
1-2-3 Design alternative plans & models for developing vocational programs
1-2-4 Develop an inventory of resources required by systems designed in prior steps
1-2-5 Determine feasibility of implementing each system. Select one system.
5-2-1 Develop techniques for isolating program and course objectives and content
8-2-4&5 Develop public relations system
9-2-1&2 Develop dissemination model(s). Determine unique operating characteristics of each

Figure 4: Linear Array - Phase II: System Design (Planning and Development)

in Phase I and establishing logical and empirical relationships among these variables. Formulation of a decision-making model for the utilization of the research data is the focus of Step 2. Step 3 investigates alternative systems and models for developing vocational programs. In addition, evaluation and personnel development models are constructed. Also, research on alternative learning activities and instructional techniques is carried out. The next step, 4, is concerned with identifying the resources required by each of the systems designed in the prior step. After this has been done, research can be initiated to determine the feasibility of the alternative systems. The end result of this would be to select a system for developing vocational programs and an evaluation system.

To briefly recap the research activities in Phase I and II, Phase I is concerned with a large variety of research activities initiated to determine the needs, problems and present status of vocational education. In Phase II the data collected in Phase I are refined and utilized in the design of several systems or models for vocational program development, professional development, and evaluation. By the end of Phase II the feasibility of the alternative systems has been determined.

Phase III

Phase III shown in Figure 5 is concerned with the development, piloting and field testing of sub-systems. The objective identified for Phase III is "Select and develop sub-systems which will have maximum impact on the total system. Pilot, field test and revise until a sub-system is ready for implementation." In the development of the research matrix, committee members agreed that time and monetary resources would not be sufficient to study and revise the entire system. Hence, this phase was designed to foster the development and testing of sub-systems. In addition, it suggests the need to investigate procedures for integrating new sub-systems with the ongoing system of vocational education.

This decision was also in agreement with the procedure which evolved for utilization of the total research matrix. The Convergence Technique was initially conceived and designed to bring about the solution of a major problem which was somewhat fixed in time and scope. The original application of the Convergence Technique was in the area of medical research where it was used to program research to develop cures for diseases. Once an effective cure was found the problem ceased to exist. However, in vocational education the problems are not fixed in time and scope. Manpower needs change as technology changes. And, societal needs change as jobs are phased out, new jobs created, and other social problems arise. As a result the committee concluded that the research matrix developed should not be conceived as a single program of research activities to attain the end goal. Instead, the research matrix was designed so that it could be used in a cyclical manner in which sub-systems would be continuously developed, refined and integrated with the ongoing system of vocational education as specific needs arose. As new data and techniques become available, these would be integrated in the appropriate phases and steps in the research matrix and used for further development. Thus, for example, on the basis of present research findings, an improved program for handicapped students might be developed and integrated with present vocational

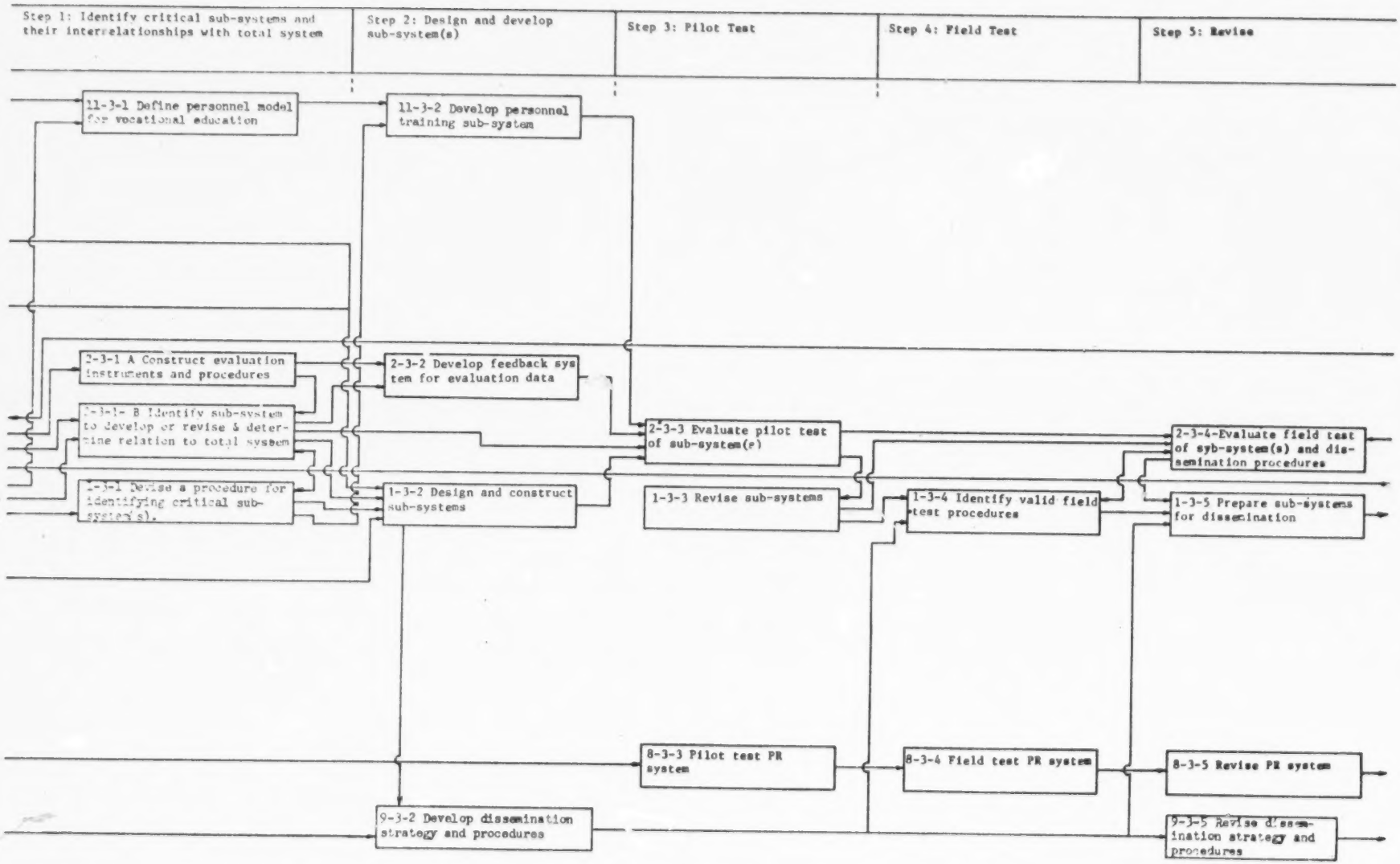
Step 1: Identify critical sub-systems and their interrelationships with total system
Step 2: Design and develop sub-system(s)
Step 3: Pilot Test
Step 4: Field Test
Step 5: Revise
11-3-1 Define personnel model for vocational education
11-3-2 Develop personnel training sub-system
2-3-1 A Construct evaluation instruments and procedures
2-3-2 Develop feedback system for evaluation data
2-3-1- B Identify sub-system to develop or revise & determine relation to total system
2-3-3 Evaluate pilot test of sub-system(s)
2-3-4-Evaluate field test of syb-system(s) and dissemination procedures
2-3-1 Devise a procedure for identifying critical sub-system(s).
1-3-2 Design and construct sub-systems
1-3-3 Revise sub-systems
1-3-4 Identify valid field test procedures
1-3-5 Prepare sub-systems for dissemination
8-3-3 Pilot test PR system
8-3-4 Field test PR system
8-3-5 Revise PR system
9-3-2 Develop dissemination strategy and procedures
9-3-5 Revise dissemination strategy and procedures

Figure 5: Linear Array - Phase III: Sub-System Development, Pilot and Field Testing

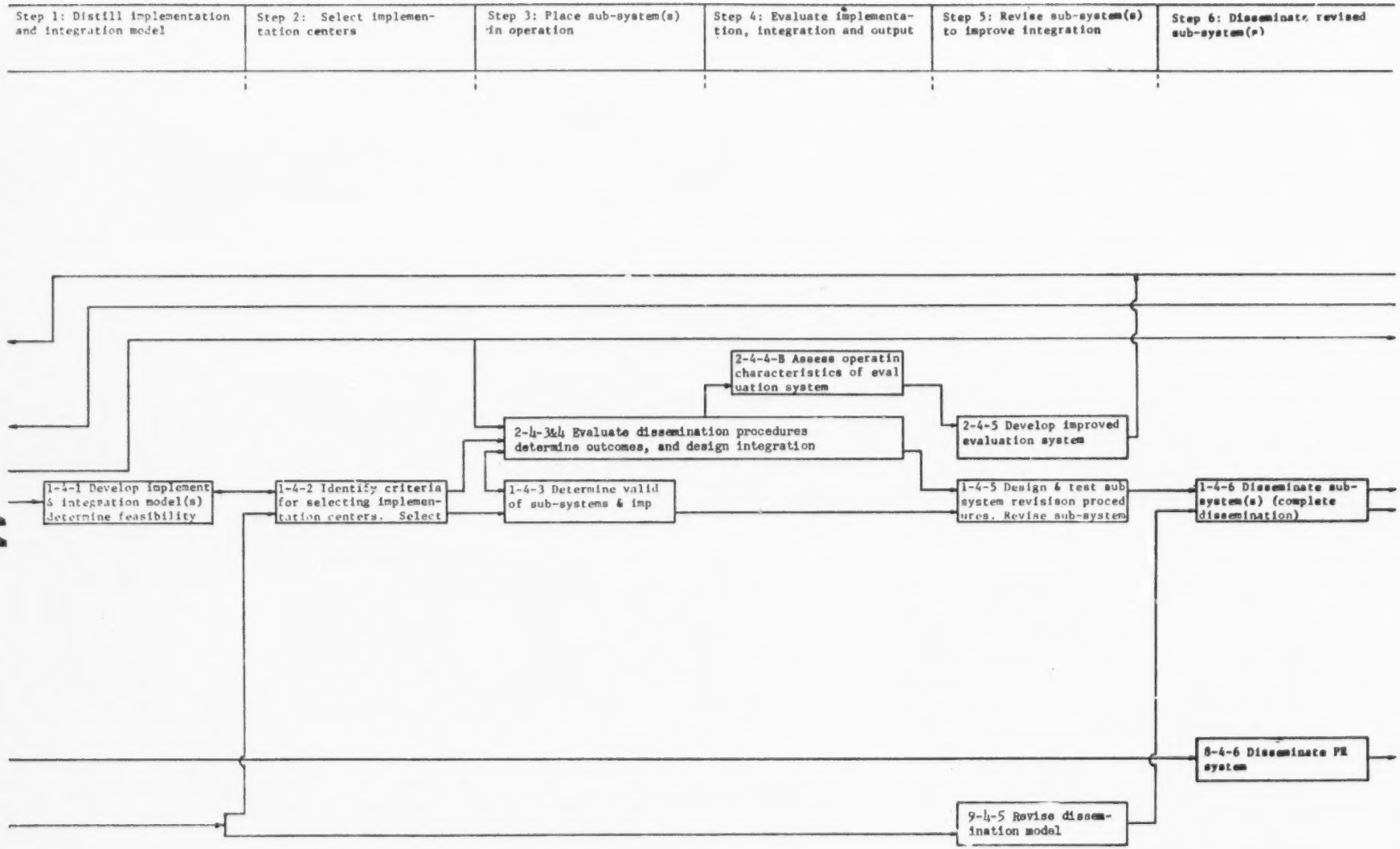
Step 1: Distill implementation and integration model
Step 2: Select implementation centers
Step 3: Place sub-system(s) in operation
Step 4: Evaluate implementation, integration and output
Step 5: Revise sub-system(s) to improve integration
Step 6: Disseminate revised sub-system(s)
1-4-1 Develop implement & integration model(s) determine feasibility
1-4-2 Identify criteria for selecting implementation centers. Select
1-4-3 Determine valid of sub-systems & imp
2-4-3&4 Evaluate dissemination procedures determine outcomes, and design integration
2-4-4-B Assess operatin characteristics of evaluation system
2-4-5 Develop improved evaluation system
1-4-5 Design & test sub system revision procedures. Revise sub-system
1-4-6 Disseminate sub-system(s) (complete dissemination)
8-4-6 Disseminate PR system
9-4-5 Revise dissemination model

Figure 6: Linear Array - Phase IV: Implementation and Integration

education programs. However, as further research data become available in Phase I, II and III, new programs could be developed and substituted for the program originally constructed.

Phase IV

Phase IV is concerned with the implementation and integration of the sub-system(s) developed in Phase III. The objective for Phase IV is "to place the sub-system(s) in operation in the schools and integrate them with the total system". Figure 6 presents the steps and subflows contained in Phase IV. Six steps were identified for this Phase. The initial step is concerned with research focused on distilling an implementation and integration model. Steps 2, 3 and 4 are concerned with selecting implementation centers, placing the sub-systems in operation, and evaluating the results. In Step 5 the research centers on procedures and techniques for revising sub-systems in order to improve their integration in the total system. In addition, the evaluation system will be reviewed at this point and the results used to improve this system. (This revision process is noted by the feedback line which runs from subflow element 2-4-5 back to prior phases and steps.) The final step in Phase IV, Step 6, is concerned with research on the dissemination of the revised sub-systems.

Phase V

Evaluation is the focus of Phase V. The objective for this phase is "assess the effectiveness of the system and determine which sub-systems lower the performance of the total system. Determine the validity of prior decisions." The steps and sub-flows of research activities in Phase V are identified in Figure 7. Three steps were identified for Phase V. Step 1 is concerned with evaluating the vocational education system and the sub-systems developed in prior phases. In Step 2 the goal is to develop dissemination procedures and techniques that will optimize the use of data collected in Step 1. The final step, 3, is concerned with assessing the effectiveness of the evaluation and dissemination.

Summary

The scope of research activities in the research matrix moves from the identification of needs in Phase I and narrows in focus in consecutive phases to the design of a program development system (Phase II), development and field testing of selected sub-systems (Phase III), implementation and integration of the selected sub-systems with total system (Phase IV), and concludes the evaluation (Phase V) of the results. As research is carried out in successive phases and steps, information related to prior research activities will be generated. This is noted in the research matrix through the feedback flow-lines. It is also envisioned that more than one cycle through the research areas specified in the matrix will be made. As new information becomes available through research activities

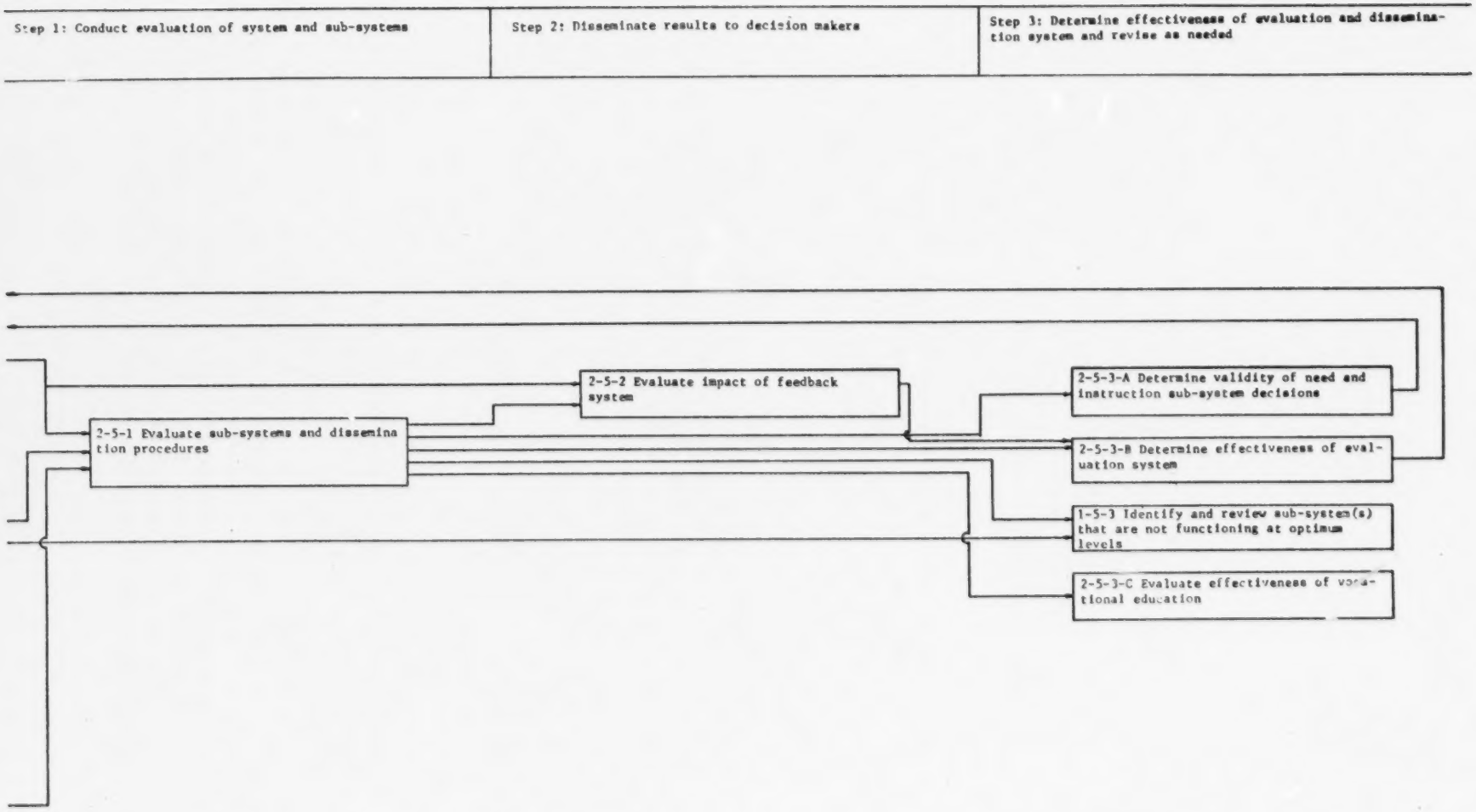
Step 1: Conduct evaluation of system and sub-systems
Step 2: Disseminate results to decision makers
Step 3: Determine effectiveness of evaluation and dissemination system and revise as needed
2-5-1 Evaluate sub-systems and dissemination procedures
2-5-2 Evaluate impact of feedback system
2-5-3-A Determine validity of need and instruction sub-system decisions
2-5-3-B Determine effectiveness of evaluation system
1-5-3 Identify and review sub-system(s) that are not functioning at optimum levels
2-5-3-C Evaluate effectiveness of vocational education

Figure 7: Linear Array - Phase V: Evaluation

carried out in Wisconsin and in other states, it will be possible to further refine the sub-systems and elements in the matrix through additional research. A graphic outline of the complete research matrix is given in Figure 8.

Relationship of the Research Matrix To Specific Research Projects

The relationship between research problems and elements in the Convergence Plan is depicted in Figure 9. Specific research problems fall within a research subflow in the research matrix. A particular research problem may generate several projects which would be carried out to attain the goal for a specific sub-step in the Convergence Plan. As described previously, the attainment of the goals for the sub-steps lead to the accomplishment of the goal for the step.

Since problems are the real world phenomena with which vocational educators work, a problem would be the starting point in utilizing the research matrix. After a problem has been identified, its location in the research matrix can be identified by identifying the subflow, phase, and step to which it relates.

Concurrent and Supplementary Arrays

Because of the length of time available for the meeting of the Matrix Generation Committee, it was not possible to systematically develop the concurrent and supplementary arrays. After reviewing the output of this committee, the Steering Committee recommended that the project not attempt to formally identify research activities in the concurrent and supplementary arrays. Steering Committee members felt that these arrays were important but that they could be developed as attempts were made to implement the rest of the research matrix. On the basis of their recommendation, the project director did not add the concurrent and supplementary arrays to the research matrix.

The following are some examples of research activities that might be placed in the concurrent array.

1. Conceptualization and development of new evaluation systems: The development of improved evaluation systems certainly will have an impact on the research carried out in the linear array. However, considerable information exists on evaluation systems and several workable models exist. Thus, it is not imperative that research be initiated in this area. What appears to be more relevant is research on the application of existing models as specified in the linear array.

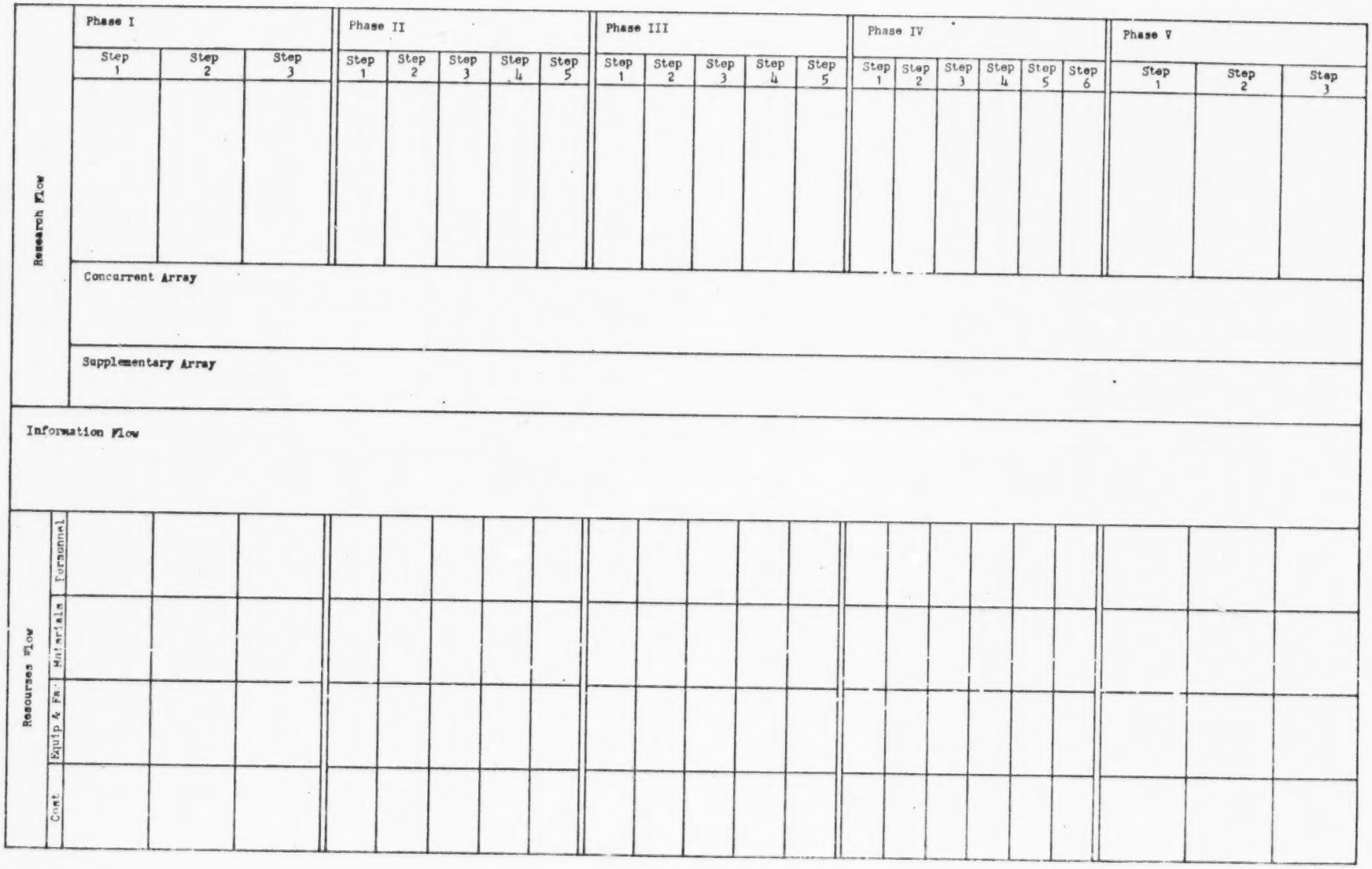

Figure 3. Graphic Outline of the Research Matrix

Level of Research Activity	Sample Activities at Each Level
Phase	Phase I: Identification and Analysis of Needs
Step	Step 1: Identify Needs
Sub-Flow	Sub-Flow 1: Identify manpower Needs (1-1-1A)
Problem	Obtaining Valid Job Market Data (Problem 2 in Research Problems Survey)
Projects	Potential Projects 1. Relationship between newspaper ads and manpower needs 2. Geographical area in which students acquire first job as an indice of manpower needs 3. Determination of geographical area to be used in projecting manpower needs

Figure 9: Relationships Between Phases, Steps, Sub-Flows, Research Problems, and Research Projects

2. Development of new research paradigms and designs for applied or action research: Certainly the development of more effective applied research techniques and designs would increase the productivity of the research in the linear array. Again, however, usable techniques are available and appear to be sophisticated enough for the research specified in the matrix.

As described in Chapter 1 the supplementary array involves longer term, more high risk research activities. These research activities are not directly correlated with any given step in the linear array; furthermore, they are generally related to the underlying conceptual structure of the discipline being investigated. Some examples of research that might be carried out in the supplementary array are:

1. Nature of psychomotor learning: The development of a more sophisticated understanding of psychomotor learning certainly would have an impact on several areas in the linear array. However, considerable information already exists on psychomotor learning and the productivity of research projects in this area would probably be relatively low and high cost per unit of output.

2. Design of improved statistical analysis procedures: More sophisticated statistical analysis techniques might extract more information from the data collected in research studies. However, a number of statistical analysis techniques are available. And, in most instances they outrun the quality of data collected in a majority of research projects. In other words, what is needed first is improved data collection instruments and techniques.

Information Flow

During meetings with the Director's Research Committee, Matrix Generation Committee, and the Steering Committee considerable time was spent discussing communications in the vocational education research community. Because of its mission, all three committees recommended that the Wisconsin Research Coordinating Unit (RCU) be the central agency in the communications network. The R.C.U. publishes the Quarterly Progress Report and Bits About Research and distributes them to vocational educators and researchers in Wisconsin. In addition, the R.C.U. has a library of research project reports, both in hard copy and on microform.

It was suggested that the R.C.U. should involve the following institutions and organizations in its communications network:

VTAE Institutes
State Advisory Council on Vocational Education
University of Wisconsin System Vocational Centers at UW - Madison and UW - Stout

Wisconsin Department of Public Instruction	Private colleges in Wisconsin
Local Vocational Education Coordinators	Wisconsin Educational Research Association
	Other appropriate state agencies

The matrix and steering committees recommended that each of the graduate school deans should receive the R.C.U. communiques. In addition, it was recommended that activities be initiated to increase the flow of information from all of the agencies mentioned above to the R.C.U. Special emphasis was given to the reporting of relevant research studies carried out in Master's and advanced graduate programs in the University of Wisconsin System and private colleges in Wisconsin. It was the consensus of the committee members that not enough is known about the research conducted in graduate programs and that graduate student research has the potential to make a significant contribution to the solution of problems in vocational education.

In addition to the agencies identified in the list above, the matrix and steering committees concluded that there were other state agencies that should be included in the communications network. For example, the Wisconsin Employment Service and Department of Vocational Rehabilitation are conducting activities related to vocational education. Further study will have to be conducted to identify all of the agencies and units that should be involved in the communications network.

The committees identified agencies that should be in the communications system. However, there will need to be further study of the flow of information within each institution. Some of the questions to be resolved are (1) to whom should the communiques be addressed; (2) what individuals or subunits in an institution need to receive information; and (3) what is the communications network within an institution? The cost effectiveness of contacting a few or many individuals in an institution will have to be studied.

Communications on research problems and activities related to a specific problem or several steps and phases will be aided by the research matrix. The flow-lines in the matrix identify relationships between various research flows, steps and phases in the research program. In addition, the projects attacking the same problem can be identified and coordinated.

The data collected in the research problems survey also provides information for the vocational education research community. A computer based retrieval system will be developed for the information collected in the survey. When this system is completed, anyone interested in a specific problem can ask to have a list of vocational educators who are concerned with the problem.

Some additional ways to stimulate communication and the flow of information in the vocational education research community identified by the Steering Committee were research meetings or conferences, meetings

of researchers investigating the same or similar problems, and the design of new techniques for communicating research results.

Resources Flow

As shown in Figure 8, the resources flow identifies the personnel, equipment and facilities, materials, and costs associated with each step in the research matrix. Since specific research projects were not identified in the linear array, it was not possible to specify the resources flow in a definitive manner. This will have to be done on the basis of specific projects. Some general concerns and procedures related to specific elements in the resources flow are presented in the following sections.

Personnel

Several sources of research personnel were identified during the project: vocational educators, University of Wisconsin staff members, staff members at the two Vocational Centers, graduate students, staff members in state agencies, staff members at the private colleges and universities in Wisconsin, and retired vocational educators. It is obvious that there is a need to identify people who are interested in various research areas and who are available to participate in research projects. The information from the research problems survey described previously is a starting point in this task.

Another source of researchers and research is graduate students. A number of studies relevant to vocational education problems are already being investigated by graduate students. However, the output from this segment of the research community could be significantly increased through the use of the research matrix. More correlated studies could be encouraged and students who are presently undertaking problems of moderate or slight interest to them could be encouraged to undertake the investigation of problems that are relevant to vocational education. Through the use of the information collected in the problems survey, graduate students could be directed to vocational educators who are very familiar with the problem to be investigated. These vocational educators could serve on an advisory committee or in an advisory capacity. As a result, the graduate student researcher could produce relevant research results, and would become more familiar with vocational - technical education in Wisconsin.

As personnel are identified and encouraged to undertake various research activities, studies should be made of the productivity of various research staffing plans. Two contrasting plans, for example, are (1) select professional researchers to conduct the studies, versus (2) select vocational educators with an interest and some proficiency in research to conduct the studies. In the latter case the professional researcher could serve as a consultant and resource person. The writer's concern with the first staffing plan is that the results of the research would tend to

remain with the researcher and would not be fully disseminated to vocational educators. If the researcher is a vocational educator, he can make direct and immediate application of the research results. Thus, various staffing combinations including vocational educators and vocational researchers for research projects should be studied to determine the optimum staffing plan in relation to research productivity and dissemination.

Equipment and Facilities

Specification of equipment and facilities would depend upon the specific research projects developed in each step. Although specific needs may arise, extensive equipment facilities and resources exist throughout the state. A variety of instructional environments are in use in vocational - technical programs. Several vocational - technical schools have advanced multi-media instructional systems. In addition, the university campuses have equipment and facilities appropriate for research. For example, in the fall of 1972, the Vocational Center at the University of Wisconsin - Stout will have access to a new applied research facility. This facility contains an information processing area, instructional research lab, and instructional media development area. The instructional research lab contains equipment which can be used to simulate industrial processes. This lab was designed for flexibility with all the utilities servicing the equipment placed under the raised computer-style floor.

Materials

As with the prior arrays in the resources flow, the materials required will depend upon the research activity initiated. A number of resources exist in this area and a part of the task of the research project directors and the coordinators of the research plan will be to make effective utilization of existing materials.

Cost

This element will no doubt be a limiting factor as funds for research are limited. This makes it very important that the cost effectiveness and cost benefits of each of the proposed research projects be considered. Moreover, the effective use of research time and effort will also have an impact on cost. Thus, it is critical that effective management be exercised. Also, a variety of sources of funds should be sought for implementing the research matrix.

Utilization of the Products of the Convergence Project

Two major products resulted from the activities conducted in the Convergence Project. To a degree they can be applied separately.

However, maximum effectiveness will be achieved when they are used in concert.

Research Problems Survey Results

Results of the problems survey can be used in several ways. The medians and inter-quartile ranges presented for each population in the survey can be used to identify the critical problems faced by vocational educators. A study of the research priorities assigned by the responders provides a basis for stimulating research and allocating research resources. In addition, the problems identified by the responder on the survey form (written in) can be used to identify unique problems faced by some vocational educators. Consideration should also be given to these as a revised survey instrument is developed in future years.

The survey responses have been punched on tab cards along with the responders title and school. Thus, it is possible to sort on a specific problem in the survey and identify vocational educators who are concerned with the problem in question. Use of this information system will allow researchers to identify resource people and possible tryout sites for their studies.

The data provided by the responders can also be used as a task analysis by individuals who are concerned with the pre-service and in-service preparation of personnel for the vocational education systems in Wisconsin. Thus, when one notes that the identification of manpower is the critical problem this suggests that the programs preparing research and planning administrators should contain educational experiences related to this area. In addition, in-service experiences could be structured for this task.

Research Matrix

The most direct application of the Convergence Plan is in the development and administration of a coordinated program of vocational research. Analysis of the linear research array presented in Figures 3 through 7 and the results of the research problems survey provide an indication of the research needed in vocational education. The convergence research matrix also assists in establishing more effective communications and utilization of resources in the vocational research community.

As mentioned in the section describing the development of the research matrix, prior research or research in progress was not considered when the elements in the matrix were identified. Thus, in some sub-steps the primary activity may be synthesis of existing research related to the problem areas specified. In many instances however, the problem area will require additional research. The research matrix will be an invaluable tool in identifying needed research and the possible relationship between this research and other research problems in the matrix.

Identification of the correlation between various research problem areas will assist the researcher in the design of his study. This will also assist in the establishment of appropriate communication channels within the vocational research community. As depicted in Figure 9 in many instances several research projects will be undertaken in a specific problem area. The research matrix will assist in coordinating these studies also. Both in the case of the related research areas which cut across steps and phases in the research matrix and research projects attacking the same problem, there is a need to design the studies and research instruments involved so that the results of individual projects can be compared and synthesized. If this is not done, the present problem of many relatively small research projects with little or no relationship to each other will continue to exist.

The research matrix developed in this study should help to coordinate vocational research. The phases, steps and flows within the matrix identify relationships and contingencies. The research problems survey data provide an indication of the magnitude and priorities in various problem areas within the matrix. Researchers can use this information to select relevant and critical areas of research in vocational education. (The data from the research problems survey has already been used in establishing research priorities for the VTAE system for 1972-73.) The research matrix also provides a means for inventorying research completed and in progress. This will assist in the task of identifying areas that need additional research. The matrix is also heuristic in that it suggests areas of research which may not have been considered before by vocational researchers.

The following example illustrates the application or use of the research matrix in development of research. The specific area to be studied in this example is 11-1-3: "Identify Professional Development Needs". One or more research projects might be initiated to attain this goal. For example, one might survey vocational educators to determine their perception of what they need in order to effectively perform their jobs. Also, one might conduct an experimental study comparing two treatments each containing different professional skills. In planning both of these studies, the research matrix indicates that consideration be given the present status, needs, and output of the vocational education system (1-1-2). Research on present status and needs of vocational education, moreover, is based on the manpower and societal needs in the region or state. In addition, Step 3 in the instruction and program development subflow specifies research related to identifying pre-employment, upgrading, and retraining needs (1-1-3A,B&C). As denoted by the flow line in Figure 3 connecting elements 1-1-3 and 11-1-3, individuals investigating professional development needs will have to maintain liaison with the research carried on in the program development area (subflow 1).

The previous paragraphs have suggested several applications of the products of this study. These and similar applications are important to the long-range impact of this study. Only through a concerted effort to utilize the research matrix and the survey data will evidence be accumulated on their validity. In addition, procedures need to be developed for using the research matrix through actual experiences with its application.

Chapter IV

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The following conclusions were developed on the basis of the research activities completed in this project.

1. On the basis of the high response rate to the research problems survey, there appears to be considerable interest in research on the part of vocational educators in Wisconsin.

2. The problems survey data provide a valid picture of major problem areas and should be used in identifying research projects. In addition, teacher educators can use the information in planning their programs.

3. The Convergence Technique can be applied to planning vocational research programs.

4. The research matrix developed in this study can be of value in establishing a coordinated program of vocational research in Wisconsin.

Recommendations

1. Results from the research problems survey should be used in planning research efforts.

2. An attempt should be made to utilize the survey results in identifying pre- and in-service professional development needs.

3. The research matrix developed in this study should be validated through application to vocational education research in Wisconsin.

   3.1 Recently completed research and research in progress should be identified with the appropriate step in the research matrix.

   3.2 Results of Step 3.1 should be used in establishing the information flow.

   3.3 A synthesis of the research results related to Phase I in the matrix should be undertaken.

   3.4 Systematic identification of the resources available for research needs to be initiated.

4. An expanded communications system for the vocational research community should be established through the R.C.U.

5. As experience is gained in using the research matrix, the concurrent and supplementary research arrays should be developed.

6. After one year the status of research and the research matrix must be reviewed. This process needs to be carried out annually.

References

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Appendix A

Convergence Research Project Steering Committee

CONVERGENCE RESEARCH PROJECT STEERING COMMITTEE

Dr. Walter T. Bjoraker
University of Wisconsin - Madison

Dr. William L. Blockstein
University of Wisconsin - Extension

Mr. Ruel Falk
Department of Public Instruction

Dr. Christopher Flizak
Department of Public Instruction

Dr. Wayne Harrison
Department of Public Instruction

Dr. Frederick Haug
University of Wisconsin - Eau Claire

Dr. Fern M. Horn
University of Wisconsin - Stevens Point

Dr. David G. Goodman
University of Wisconsin - Whitewater

Dr. Jack Kirby
University of Wisconsin - Platteville

Mr. Roland Krogstad
Wisconsin Board of Vocational, Technical and Adult Education

Dr. Robert Ristau
Department of Public Instruction

Dr. Harland Samson
University of Wisconsin - Madison

Mr. Leonard Sterry
Department of Public Instruction

Dr. Merle Strong
University of Wisconsin - Madison

Dr. David Witmer
University of Wisconsin System

Appendix B

Research Matrix Planning Committee

RESEARCH MATRIX PLANNING COMMITTEE

Ruel Falk
Bureau for Career and Manpower Development
Department of Public Instruction

Roland Krogstad
Research Consultant
Wisconsin Board of Vocational, Technical and Adult Education

Allan May
Local Vocational Education Coordinator
Cooperative Educational Service Agency 5

Warren Leonard
Administrator of Instructional Services, Research and Planning
Vocational, Technical and Adult Education District 18

Robert Ristau
Director for Career and Manpower Development
Department of Public Instruction

Appendix C

Research Problems Survey Instrument

UW - Stout

Convergence Project
Orville Nelson

RESEARCH PROBLEMS IN VOCATIONAL - TECHNICAL EDUCATION

Directions: This instrument lists a number of problems in vocational and technical education. These problems have been grouped into sets of similar problems related to a general problem area. In order to shorten this form, several representative problems are listed for each problem area. These were selected on the basis of their frequent occurence in my conversations with vocational - technical educators in Wisconsin. Respond to each problem area and problem.

Rate the magnitude of each problem in your district and indicate how soon research should be initiated. You will make two responses to each item. The responses are explained below. Circle your responses. If an important problem has been omitted, please list it in the space labelled as "other" and rate its magnitude. Please give the information requested below and then review the rating codes.

Name _____ Title _____ School _____

Magnitude Ratings:

NOT: problem does not occur in district
MODerate: continuing problem but does not have a major impact on achieving our objectives
VERY CRITical: problem has a significant impact on meeting our objectives and should have top priority in our budget. This rating should be used for the 4 or 5 most critical problems.

Research Needed Ratings:

Within 1 year: Research should be started as soon as possible
1-5 yrs: Research can be deferred beyond the coming year but should be completed within this time period.
6 yrs & over: No immediate need for the research

Problem Area and Problems	MAGNITUDE OF PROBLEM IN DISTRICT (NOT 1 2 3 4 5 6 7 VERY CRIT)	RESEARCH NEEDED (Within 1 year 1 / 1-5 yrs. 2 / 6 yrs. & over 3)
1. Determining the Need for Vocational - Technical Programs	1 2 3 4 5 6 7	1 2 3
Problems:		
2. Obtaining valid job market data	1 2 3 4 5 6 7	1 2 3
3. Forecasting manpower requirements for our area and region	1 2 3 4 5 6 7	1 2 3
4. Determining the occupational training needs of the people in our district	1 2 3 4 5 6 7	1 2 3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
5. Selecting the relative emphasis to place on student needs and interests as contrasted to job market needs when planning programs	1	2	3	4	5	6	7	1	2	3
6. Other: _____	1	2	3	4	5	6	7	1	2	3
7. Other: _____	1	2	3	4	5	6	7	1	2	3
8. Other: _____	1	2	3	4	5	6	7	1	2	3
9. Other: _____	1	2	3	4	5	6	7	1	2	3
10. Other: _____	1	2	3	4	5	6	7	1	2	3
11. Program and Curriculum Development	1	2	3	4	5	6	7	1	2	3
Problems:										
12. Identifying the appropriate set of programs for my school (s)	1	2	3	4	5	6	7	1	2	3
13. Selecting relevant content for the programs we offer	1	2	3	4	5	6	7	1	2	3
14. Determining the feasibility of a program on the basis of manpower requirements and district resources	1	2	3	4	5	6	7	1	2	3
15. Keeping the content of our programs current with industry	1	2	3	4	5	6	7	1	2	3
16. Working with accrediting agencies and associations in the development and approval of new programs. If this is a problem, please name the program(s) involved: _____	1	2	3	4	5	6	7	1	2	3
_____	1	2	3	4	5	6	7	1	2	3
_____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
17. Providing flexible entry points to programs so students can start when they desire and at their own level. (Includes open door, remedial work and advanced standing.)	1	2	3	4	5	6	7	1	2	3
18. Selecting the criterion level of performance to use in behavioral objectives	1	2	3	4	5	6	7	1	2	3
19. Developing programs of interest and value to adults	1	2	3	4	5	6	7	1	2	3
20. Providing relevant general education experiences in our programs	1	2	3	4	5	6	7	1	2	3
21. Developing retraining programs for unemployed . .	1	2	3	4	5	6	7	1	2	3
22. Deciding if a core or cluster approach would be effective in some of our programs	1	2	3	4	5	6	7	1	2	3
23. Determining the most efficient and effective sequence of learning experiences in a program . .	1	2	3	4	5	6	7	1	2	3
24. Identifying the type(s) of students who will be successful in a program	1	2	3	4	5	6	7	1	2	3
25. Scheduling and assigning programs to locations to maximize their availability to people in the district or area	1	2	3	4	5	6	7	1	2	3
26. Articulating programs within my school(s)	1	2	3	4	5	6	7	1	2	3
27. Articulating our programs with those in schools the students attend prior to enrolling in our school(s)	1	2	3	4	5	6	7	1	2	3
28. Articulating our programs with those in which our students enroll after completing our programs	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
29. Other: _____	1	2	3	4	5	6	7	1	2	3
30. Other: _____	1	2	3	4	5	6	7	1	2	3
31. Other: _____	1	2	3	4	5	6	7	1	2	3
32. Other: _____	1	2	3	4	5	6	7	1	2	3
33. Developing Effective Learning Activities and Materials (Includes media, instructional packages, simulations, etc.)	1	2	3	4	5	6	7	1	2	3
Problems:										
34. Determining the relative effectiveness of various types of learning activities and materials in attaining course objectives	1	2	3	4	5	6	7	1	2	3
35. Designing activities and materials to attain course objectives	1	2	3	4	5	6	7	1	2	3
36. Scheduling time for the development of learning activities and materials	1	2	3	4	5	6	7	1	2	3
37. Specifying the role of the teacher in new instructional systems	1	2	3	4	5	6	7	1	2	3
38. Providing learning activities and materials that are appropriate for the learning style of the individual	1	2	3	4	5	6	7	1	2	3
39. Humanizing learning experiences	1	2	3	4	5	6	7	1	2	3
40. Writing behavioral objectives	1	2	3	4	5	6	7	1	2	3
41. Other: _____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
42. Other: _____	1	2	3	4	5	6	7	1	2	3
43. Other: _____	1	2	3	4	5	6	7	1	2	3
44. Other: _____	1	2	3	4	5	6	7	1	2	3
45. Evaluating Programs, Students and Staff	1	2	3	4	5	6	7	1	2	3
Problems:										
46. Designing more valid and reliable measures of skills and cognitive knowledges	1	2	3	4	5	6	7	1	2	3
47. Developing more valid and reliable measures for the affective domain (Attitudes, interests, etc.)	1	2	3	4	5	6	7	1	2	3
48. Improving the grading procedures used in our courses	1	2	3	4	5	6	7	1	2	3
49. Developing better follow-up procedures	1	2	3	4	5	6	7	1	2	3
50. Designing and carrying out a program evaluation .	1	2	3	4	5	6	7	1	2	3
51. Determining the impact occupational education has on students	1	2	3	4	5	6	7	1	2	3
52. Designing and using valid staff evaluation procedures	1	2	3	4	5	6	7	1	2	3
53. Utilizing evaluation data in decision-making . .	1	2	3	4	5	6	7	1	2	3
54. Other: _____	1	2	3	4	5	6	7	1	2	3
55. Other: _____	1	2	3	4	5	6	7	1	2	3
56. Other: _____	1	2	3	4	5	6	7	1	2	3
57. Other: _____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
58. Assessing Student Characteristics and Their Relationship to Success in Occupational Education Programs .	1	2	3	4	5	6	7	1	2	3
Problems:										
59. Obtaining valid and reliable measures of students' abilities and interests	1	2	3	4	5	6	7	1	2	3
60. Developing profiles of student characteristics for specific programs	1	2	3	4	5	6	7	1	2	3
61. Determining student characteristics that relate to success in our programs	1	2	3	4	5	6	7	1	2	3
62. Identifying student characteristics that can be modified and those that cannot	1	2	3	4	5	6	7	1	2	3
63. Other: _____	1	2	3	4	5	6	7	1	2	3
64. Other: _____	1	2	3	4	5	6	7	1	2	3
65. Other: _____	1	2	3	4	5	6	7	1	2	3
66. Other: _____	1	2	3	4	5	6	7	1	2	3
67. Other: _____	1	2	3	4	5	6	7	1	2	3
68. Determining the Scope and Effectiveness of Student Services	1	2	3	4	5	6	7	1	2	3
Problems:										
69. Developing more effective recruiting procedures	1	2	3	4	5	6	7	1	2	3
70. Assessing the influence of student clubs on the professional and social development of students	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
71. Designing more effective vocational counseling programs	1	2	3	4	5	6	7	1	2	3
72. Developing a more effective placement program . .	1	2	3	4	5	6	7	1	2	3
73. Other: _____	1	2	3	4	5	6	7	1	2	3
74. Other: _____	1	2	3	4	5	6	7	1	2	3
75. Other: _____	1	2	3	4	5	6	7	1	2	3
76. Other: _____	1	2	3	4	5	6	7	1	2	3
77. Developing Programs and Services to Meet the Needs of Disadvantaged Students	1	2	3	4	5	6	7	1	2	3
Problems:										
78. Identifying and developing programs that are relevant for the disadvantaged	1	2	3	4	5	6	7	1	2	3
79. Developing learning activities that are effective with the disadvantaged	1	2	3	4	5	6	7	1	2	3
80. Initiating services that assist the disadvantaged in successfully completing occupational programs (counseling, remedial work, placement, etc.) . .	1	2	3	4	5	6	7	1	2	3
81. Selecting and/or training staff to work with the disadvantaged	1	2	3	4	5	6	7	1	2	3
82. Other: _____	1	2	3	4	5	6	7	1	2	3
83. Other: _____	1	2	3	4	5	6	7	1	2	3
84. Other: _____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
85. Other: _____	1	2	3	4	5	6	7	1	2	3
86. Other: _____	1	2	3	4	5	6	7	1	2	3
87. Developing Programs that Meet the Needs of the Handicapped	1	2	3	4	5	6	7	1	2	3
Problems:										
88. Developing programs and services for the physically handicapped	1	2	3	4	5	6	7	1	2	3
89. Designing and offering programs for the mentally handicapped	1	2	3	4	5	6	7	1	2	3
90. Providing programs for court referrals and incarcerated persons	1	2	3	4	5	6	7	1	2	3
91. Other: _____	1	2	3	4	5	6	7	1	2	3
92. Other: _____	1	2	3	4	5	6	7	1	2	3
93. Other: _____	1	2	3	4	5	6	7	1	2	3
94. Other: _____	1	2	3	4	5	6	7	1	2	3
95. Providing an Effective Professional Development Program for Our Staff	1	2	3	4	5	6	7	1	2	3
Problems:										
96. Determining competencies our staff members need to develop	1	2	3	4	5	6	7	1	2	3
97. Developing better teaching methods	1	2	3	4	5	6	7	1	2	3

		MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
		NOT			MOD			VERY CRITICAL	Within 1 year	1-5 yrs.	6 yrs & over
98.	Providing appropriate in-service experiences for our administrative staff	1	2	3	4	5	6	7	1	2	3
99.	Selecting and providing incentives that will motivate our staff to improve their competencies	1	2	3	4	5	6	7	1	2	3
100.	Upgrading and updating technical competencies	1	2	3	4	5	6	7	1	2	3
101.	Obtaining new staff members with appropriate pre-service training	1	2	3	4	5	6	7	1	2	3
102.	Developing an effective in-service program	1	2	3	4	5	6	7	1	2	3
103.	Obtaining courses, workshops and teachers for our in-service program	1	2	3	4	5	6	7	1	2	3
104.	Other: _____	1	2	3	4	5	6	7	1	2	3
105.	Other: _____	1	2	3	4	5	6	7	1	2	3
106.	Other: _____	1	2	3	4	5	6	7	1	2	3
107.	Other: _____	1	2	3	4	5	6	7	1	2	3
108.	Developing an Effective Career Education Program										
	Problems:										
109.	Designing an articulated K through adult career education program	1	2	3	4	5	6	7	1	2	3
110.	Relating career education concepts to the developmental stages of students	1	2	3	4	5	6	7	1	2	3
111.	Identifying career decision-making procedures that lead to valid career selections on the part of students	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRITICAL	Within 1 year	1-5 yrs.	6 yrs & over
112. Integrating career development concepts with present courses and programs	1	2	3	4	5	6	7	1	2	3
113. Other: _____	1	2	3	4	5	6	7	1	2	3
114. Other: _____	1	2	3	4	5	6	7	1	2	3
115. Other: _____	1	2	3	4	5	6	7	1	2	3
116. Other: _____	1	2	3	4	5	6	7	1	2	3
117. Creating Effective Administrative Procedures and Structures	1	2	3	4	5	6	7	1	2	3
Problems:										
118. Developing an effective administrative structure	1	2	3	4	5	6	7	1	2	3
119. Defining the role of para-professionals	1	2	3	4	5	6	7	1	2	3
120. Identifying appropriate staff loads (assignments)	1	2	3	4	5	6	7	1	2	3
121. Providing effective communication channels	1	2	3	4	5	6	7	1	2	3
122. Other: _____	1	2	3	4	5	6	7	1	2	3
123. Other: _____	1	2	3	4	5	6	7	1	2	3
124. Other: _____	1	2	3	4	5	6	7	1	2	3
125. Other: _____	1	2	3	4	5	6	7	1	2	3
126. Other: _____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs. & over
	1	2	3	4	5	6	7	1	2	3
127. Utilization of Research Techniques and Results	1	2	3	4	5	6	7	1	2	3
Problems:										
128. Obtaining research data needed in decision-making	1	2	3	4	5	6	7	1	2	3
129. Using research data in decision-making	1	2	3	4	5	6	7	1	2	3
130. Encouraging staff members to use research data	1	2	3	4	5	6	7	1	2	3
131. Developing research competencies in our staff	1	2	3	4	5	6	7	1	2	3
132. Other: _____	1	2	3	4	5	6	7	1	2	3
133. Other: _____	1	2	3	4	5	6	7	1	2	3
134. Other: _____	1	2	3	4	5	6	7	1	2	3
135. Other: _____	1	2	3	4	5	6	7	1	2	3
136. Other: _____	1	2	3	4	5	6	7	1	2	3
137. Identifying and Allocating Resources	1	2	3	4	5	6	7	1	2	3
Problems:										
138. Identifying the various financial, human and other resources available to support our programs	1	2	3	4	5	6	7	1	2	3
139. Determining the costs, benefits and effectiveness of our present programs	1	2	3	4	5	6	7	1	2	3
140. Determining the costs, benefits and effectiveness of our proposed programs	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs	6 yrs & over
141. Developing a valid budget	1	2	3	4	5	6	7	1	2	3
142. Effectively utilizing staff time and energy in attaining our objectives	1	2	3	4	5	6	7	1	2	3
143. Obtaining the funds required to meet our objectives	1	2	3	4	5	6	7	1	2	3
144. Other: _____	1	2	3	4	5	6	7	1	2	3
145. Other: _____	1	2	3	4	5	6	7	1	2	3
146. Other: _____	1	2	3	4	5	6	7	1	2	3
147. Planning, Obtaining and Utilizing Facilities and Equipment	1	2	3	4	5	6	7	1	2	3
Problems:										
148. Projecting the need for new facilities during the next five to ten years	1	2	3	4	5	6	7	1	2	3
149. Making maximum use of present facilities and equipment	1	2	3	4	5	6	7	1	2	3
150. Planning facilities that facilitate learning . .	1	2	3	4	5	6	7	1	2	3
151. Providing adequate maintenance of facilities and equipment	1	2	3	4	5	6	7	1	2	3
152. Identifying the need for new facilities to local voters	1	2	3	4	5	6	7	1	2	3
153. Other: _____	1	2	3	4	5	6	7	1	2	3
154. Other: _____	1	2	3	4	5	6	7	1	2	3

	MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
	NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs.	6 yrs & over
155. Other: _____	1	2	3	4	5	6	7	1	2	3
156. Other: _____	1	2	3	4	5	6	7	1	2	3
/57. Making Valid Decisions and Plans	1	2	3	4	5	6	7	1	2	3
Problems:										
158. Identifying objectives for my school(s)	1	2	3	4	5	6	7	1	2	3
159. Developing long-range plans	1	2	3	4	5	6	7	1	2	3
160. Selecting the information and techniques needed in decision-making	1	2	3	4	5	6	7	1	2	3
161. Developing a planning system for my area	1	2	3	4	5	6	7	1	2	3
162. Developing a bank of information that can be used in planning and decision-making	1	2	3	4	5	6	7	1	2	3
163. Initiating a program planning and budgeting system	1	2	3	4	5	6	7	1	2	3
164. Other: _____	1	2	3	4	5	6	7	1	2	3
165. Other: _____	1	2	3	4	5	6	7	1	2	3
166. Other: _____	1	2	3	4	5	6	7	1	2	3
/67. Maintaining an Effective Public Relations Program . . .	1	2	3	4	5	6	7	1	2	3
Problems:										
168. Developing a better image of vocational - technical education	1	2	3	4	5	6	7	1	2	3

		MAGNITUDE OF PROBLEM IN DISTRICT							RESEARCH NEEDED		
		NOT			MOD			VERY CRIT	Within 1 year	1-5 yrs	6 yrs & over
169.	Providing prospective students with information on the programs offered in our school(s)	1	2	3	4	5	6	7	1	2	3
170.	Designing an ongoing public relations program . .	1	2	3	4	5	6	7	1	2	3
171.	Other: _____	1	2	3	4	5	6	7	1	2	3
172.	Other: _____	1	2	3	4	5	6	7	1	2	3
173.	Other: _____	1	2	3	4	5	6	7	1	2	3
174.	Other: _____	1	2	3	4	5	6	7	1	2	3
173.	Other: _____	1	2	3	4	5	6	7	1	2	3
174.	Other: _____	1	2	3	4	5	6	7	1	2	3

Thank you for taking the time to respond. Please return this form in the enclosed envelope.
Send to Orville Nelson
UW - Stout
Menomonie, Wisconsin 54751

Appendix D

Results of Research Problems Survey

TABLE - A1

VTAE Directors and Instructional Services Responses to Convergence Problems

Problem	VTAE Directors N=10				Instructional Services N=16			
	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
1	4.50	2.50	1.50	1.00	4.50	1.57	1.83	.84
2	4.33	2.29	1.80	1.00	5.16	1.66	1.72	1.00
3	5.00	2.75	1.75	.87	5.21	1.35	1.62	1.05
4	5.66	2.16	1.60	.98	5.33	1.96	1.50	1.16
5	4.00	1.00	1.90	.79	4.00	1.00	2.10	.80
11	6.00	1.75	1.66	.95	4.33	2.87	1.80	.77
12	5.16	2.00	1.70	.93	3.66	2.54	2.25	1.25
13	4.50	4.00	1.87	.93	4.72	1.06	1.83	.97
14	5.50	2.33	1.70	.93	5.00	1.00	1.72	1.00
15	4.00	1.00	1.90	.79	4.66	1.43	1.88	.61
16	6.25	4.54	1.37	1.68	4.66	2.79	1.75	1.68
17	5.75	2.25	1.37	.97	5.35	1.21	1.30	.93
18	5.62	1.18	1.80	.77	5.50	1.57	1.75	.98
19	3.87	1.06	2.08	.58	4.78	2.35	2.05	.88
20	4.25	2.50	2.00	.69	4.33	2.08	2.13	.72
21	5.25	2.25	1.20	.77	5.00	2.33	1.50	1.16
22	4.20	.77	1.91	.58	4.90	1.91	2.00	.66
23	4.12	1.93	2.00	1.25	4.50	2.33	1.87	1.07
24	4.75	1.87	1.62	.97	5.00	2.45	1.50	1.20
25	3.66	2.37	2.33	1.16	5.16	2.75	1.50	1.29
26	4.00	1.25	2.00	.69	4.16	2.41	2.10	.80
27	4.25	1.75	1.91	.58	5.50	2.07	1.50	1.16
28	5.50	3.25	1.50	1.00	4.16	2.00	2.05	.88

TABLE - A1	VTAE Directors				Instructional Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
33	5.00	1.75	1.75	.87	5.30	1.20	1.50	1.00
34	4.16	1.50	1.92	.57	5.50	2.42	1.50	1.00
35	4.90	1.79	1.92	.57	5.30	2.20	1.22	.88
36	4.50	2.66	2.00	.66	5.75	2.20	1.16	.66
37	4.50	3.00	1.83	.66	5.92	2.00	1.25	.87
38	4.50	2.66	1.50	1.00	5.83	2.58	1.38	1.05
39	4.75	1.08	1.50	1.00	5.00	3.00	1.75	1.08
40	5.00	3.33	1.50	1.16	4.83	2.37	1.64	1.05
45	5.50	3.00	1.87	.62	4.00	.75	2.10	.60
46	5.16	2.50	1.75	1.08	4.66	1.93	1.95	.64
47	5.50	2.66	1.75	1.08	5.50	2.20	1.83	.84
48	5.50	1.66	1.50	1.00	4.50	3.25	1.94	.88
49	5.50	2.50	1.75	1.08	4.83	2.00	1.90	.79
50	5.10	.80	1.92	.57	5.00	1.00	1.75	1.08
51	5.16	2.00	1.83	.66	5.10	2.86	1.83	.97
52	6.16	1.33	1.30	.93	5.66	1.83	1.50	1.16
53	6.00	1.37	1.62	.97	5.62	2.52	1.71	1.02
58	4.90	1.14	1.70	1.07	4.66	2.66	2.00	.89
59	4.50	2.00	2.00	1.00	5.00	2.25	1.70	1.31
60	4.25	1.75	1.90	.79	4.50	3.37	1.90	1.42
61	4.50	1.66	1.83	1.33	4.83	3.00	1.92	1.05
62	4.50	1.66	1.90	.79	4.40	2.12	1.85	1.00
68	5.00	1.00	1.50	1.00	4.33	1.87	2.00	.69
69	4.50	2.16	1.75	1.08	4.50	2.40	1.62	1.05
70	4.50	2.50	2.10	.80	4.70	1.75	1.83	.97
71	4.83	1.50	1.90	.79	5.07	2.00	1.61	.98
72	5.00	2.83	1.50	1.00	4.75	2.33	1.50	1.16

TABLE - A1	VTAE Directors				Instructional Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
77	5.16	2.00	1.50	1.00	5.00	.83	1.33	.95
78	5.50	2.00	1.30	.93	5.16	2.00	1.50	1.07
79	5.50	2.33	1.50	1.00	5.83	1.50	1.38	1.05
80	5.75	1.75	1.70	.93	5.50	1.86	1.22	.83
81	5.70	.93	1.62	.97	5.25	1.75	1.30	1.00
87	4.83	1.50	1.70	.93	4.50	2.08	1.70	1.07
88	5.16	2.00	1.83	.66	5.00	2.45	1.64	1.05
89	5.16	2.00	1.83	.66	5.50	2.16	1.90	.79
90	4.30	1.60	1.90	.79	4.50	1.46	2.00	.57
95	5.12	1.06	1.62	.97	5.25	1.25	1.83	.66
96	5.00	1.00	1.83	1.33	5.33	1.33	1.38	.98
97	5.50	2.16	1.90	.79	5.35	1.46	1.50	1.00
98	5.50	2.33	1.75	1.08	5.66	1.58	1.50	1.00
99	5.16	2.00	1.83	.66	5.50	1.57	1.38	1.05
100	5.16	2.00	1.83	.66	5.16	1.66	1.77	.83
101	4.50	1.66	2.25	1.08	4.50	1.75	1.94	.77
102	5.50	2.50	1.75	1.08	5.00	1.41	1.50	1.08
103	4.25	1.25	2.00	1.00	5.10	1.62	1.66	1.16
108	*	*	*	*	*	*	*	*
109	4.87	1.31	1.91	.74	5.00	2.66	1.86	.72
110	4.90	.79	1.90	.79	4.83	2.62	1.94	.77
111	5.25	1.75	1.90	.79	4.83	2.00	1.83	.84
112	5.25	1.25	1.75	1.08	4.90	1.62	1.83	.84
117	5.83	2.41	1.21	.89	5.50	3.50	2.00	.75
118	5.50	2.33	1.30	1.10	5.00	3.20	1.62	1.05
119	5.50	2.00	1.50	1.00	6.21	1.19	1.11	.61

TABLE - A1	VTAE Directors				Instructional Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
120	5.50	4.33	1.50	1.50	5.16	2.00	1.70	.93
121	5.00	2.50	1.70	.93	5.50	2.45	1.30	1.00
127	5.00	2.12	1.80	1.00	4.33	1.87	1.91	.58
128	6.00	2.33	1.75	1.08	5.33	1.26	1.61	.98
129	6.50	2.50	1.83	1.33	5.10	1.54	1.75	.98
130	5.16	2.00	1.90	.79	5.35	1.14	1.80	.77
131	4.25	1.75	1.90	.79	4.83	1.66	1.92	1.05
137	4.75	1.25	1.93	.56	5.50	1.50	1.75	.87
138	5.00	2.00	1.83	.66	5.50	2.00	1.80	.89
139	5.16	2.33	1.30	.93	5.50	1.86	1.61	.98
140	5.25	1.25	1.70	.93	5.90	1.60	1.38	.98
141	4.83	2.00	1.50	1.50	4.83	3.00	1.64	1.14
142	5.16	2.50	1.83	.66	5.30	1.59	1.50	1.16
143	4.50	2.66	1.50	1.00	4.70	2.33	1.94	.88
147	5.25	3.62	1.62	1.12	5.50	2.25	1.83	1.08
148	5.50	2.00	1.83	.66	5.78	2.35	1.64	1.14
149	5.83	4.00	1.83	1.33	5.00	2.75	1.90	.79
150	6.00	3.33	1.90	.79	5.83	1.77	1.50	1.29
151	4.10	.80	2.00	.66	3.78	2.05	2.61	.98
152	5.16	3.00	1.75	1.08	5.50	2.20	1.38	1.30
157	5.50	2.00	1.37	.97	5.50	3.33	1.83	1.33
158	4.50	3.50	2.00	1.66	4.83	3.70	1.87	1.07
159	5.16	2.50	1.75	1.08	5.50	2.33	1.78	1.19
160	6.00	3.33	1.30	1.10	5.00	1.00	1.83	.97
161	5.83	3.00	1.70	.93	5.25	2.70	1.75	1.08
162	5.83	3.00	1.70	.93	5.16	2.70	1.72	1.00

TABLE - A1	VTAE Directors				Instructional Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
163	5.75	1.75	1.62	.97	5.30	2.33	1.50	1.16
167	5.00	3.62	1.40	.98	4.33	2.37	2.00	.69
168	4.50	3.50	1.83	1.33	5.50	2.60	1.75	1.08
169	4.50	3.50	1.50	1.16	5.00	3.83	1.66	1.26
170	5.50	2.66	1.75	1.08	5.00	3.12	1.71	1.12

* The response choices for this item were inadvertently left off the form.

TABLE - A2

Research and Planning and Student Services Responses to Convergence Problems

Problem	Research and Planning N=17				Student Services N=14			
	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
1	6.00	2.22	1.22	.82				
2	5.85	1.40	1.20	.83				
3	5.71	1.27	1.27	.90				
4	6.20	1.76	1.27	.90				
5	5.14	1.40	1.72	.90				
11	4.20	1.12	1.93	.56				
12	5.00	1.56	2.03	.60				
13	4.71	1.27	2.00	.65				
14	5.12	2.35	1.83	.66				
15	5.00	2.22	1.92	.65				
16	4.25	2.95	1.92	1.05				
17	4.75	2.26	1.64	1.14				
18	4.35	1.46	1.77	.83				
19	4.40	1.57	1.93	.56				
20	4.25	2.20	1.96	.61				
21	4.91	1.62	1.89	.60				
22	4.28	2.07	1.90	.77				
23	4.16	1.66	1.95	.70				
24	4.88	1.04	1.90	.77				
25	5.33	2.62	1.77	1.04				
26	4.00	1.93	2.00	.65				
27	4.75	2.30	1.77	1.04				
28	3.75	2.10	2.11	1.01				

The Student Services Instrument contained a sub-set of items from the complete survey form. Item 58 in the complete survey form corresponds to the first item in the student services form.

TABLE - A2	Research and Planning				Student Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
33	5.00	1.62	1.68	.94				
34	4.21	1.52	1.83	.66				
35	4.16	1.66	2.00	.57				
36	4.58	1.54	1.95	.85				
37	4.41	1.97	1.90	.77				
38	4.60	1.48	2.00	.65				
39	4.42	1.42	1.95	.70				
40	4.80	1.70	1.81	.85				
45	5.00	2.06	1.83	.66				
46	4.62	1.91	1.55	.99				
47	4.87	1.74	1.81	.85				
48	4.58	1.41	2.04	.70				
49	4.41	1.54	2.00	.65				
50	4.60	1.48	1.87	.70				
51	5.37	2.00	1.75	.96				
52	5.25	1.87	1.55	.99				
53	5.70	2.25	1.61	.98				
58	4.75	2.40	1.83	.66	5.78	1.71	1.64	.97
59	4.90	1.53	1.77	.83	4.33	2.12	1.90	.69
60	5.00	2.02	1.77	.83	5.50	1.45	1.78	1.08
61	4.83	1.92	1.77	.83	5.66	1.37	1.50	1.08
62	4.87	1.97	1.81	1.03	4.37	2.12	2.18	.90
68	5.00	1.83	1.93	.68	5.00	3.83	1.90	.79
69	5.00	2.25	1.80	.89	4.75	2.00	1.85	1.00
70	4.10	1.91	2.10	.80	3.83	2.25	1.78	1.08
71	5.16	1.66	1.88	.61	5.30	1.73	1.72	.91
72	5.25	1.62	1.75	.87	5.83	2.13	1.37	.97

TABLE - A2	Research and Planning				Student Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
77	5.12	1.54	1.41	.99	6.25	1.25	1.21	.80
78	5.16	1.50	1.38	.98	5.85	1.19	1.15	.64
79	5.50	1.33	1.50	1.00	6.08	1.14	1.15	.64
80	5.50	1.66	1.30	1.00	5.85	1.19	1.31	.94
81	5.66	1.83	1.38	.98	5.16	2.16	1.75	.87
87	5.00	2.00	1.64	.97	5.33	1.37	1.37	.97
88	4.66	1.43	1.91	.66	4.87	1.68	1.77	.82
89	4.78	1.52	1.86	.72	4.75	3.02	1.77	.82
90	4.16	1.50	2.00	.79	4.12	1.95	2.00	.75
95	4.80	1.47	1.81	.73				
96	5.00	1.00	1.91	.66				
97	5.00	1.00	1.83	.66				
98	4.78	1.25	1.83	.66				
99	4.92	1.33	1.80	.89				
100	4.50	1.23	1.96	.61				
101	4.35	1.46	1.91	.66				
102	4.75	1.70	1.92	.57				
103	4.10	.80	1.96	.61				
108	*	*	*	*	*	*	*	*
109	4.75	2.90	1.77	.83	5.80	1.30	1.25	.87
110	4.75	2.50	1.91	.66	6.08	1.14	1.22	.82
111	4.92	1.25	1.83	.66	6.20	1.30	1.31	.94
112	4.87	2.07	1.75	.87	6.00	.83	1.87	.62
117	4.80	1.26	1.75	1.02				
118	5.00	2.12	1.81	1.03				
119	4.83	2.00	1.91	.66				

TABLE - A2	Research and Planning				Student Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
120	5.07	1.25	1.80	.89				
121	5.50	1.80	1.50	1.00				
127	4.66	1.57	1.71	.91				
128	5.50	2.66	1.62	1.05				
129	5.00	1.58	1.77	.83				
130	5.61	1.55	1.77	.83				
131	4.83	1.33	1.80	.89				
137	4.50	1.45	1.87	.62				
138	5.00	1.89	1.80	.89				
139	6.00	2.33	1.38	.98				
140	5.50	2.25	1.77	.83				
141	4.50	1.80	1.80	.89				
142	4.83	1.50	1.86	.72				
143	5.50	1.80	1.50	1.07				
147	5.83	1.91	1.50	1.00				
148	5.50	3.20	1.50	1.07				
149	5.70	2.33	1.50	1.07				
150	4.75	2.33	1.70	.93				
151	4.16	1.50	1.91	.66				
152	4.83	2.91	1.77	.83				
157	4.25	2.04	1.92	.71				
158	4.66	1.33	1.86	.72				
159	5.83	1.77	1.38	1.05				
160	4.83	1.50	1.91	.66				
161	5.07	1.20	1.83	.66				
162	4.90	1.75	1.86	.72				

TABLE - A2	Research and Planning				Student Services			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
163	5.50	2.20	1.83	.84				
167	4.83	2.00	1.70	1.07				
168	5.58	1.83	1.88	.86				
169	4.83	1.50	1.80	.89				
170	5.16	1.39	1.86	.72				

* The response choices for this item were inadvertently left off the form.

TABLE - B1

DPI and LVEC Responses to Convergence Problems

Problem	DPI N=6				LVEC N=104			
	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
1	6.83	2.66	1.16	.66	4.60	2.46	1.77	.97
2	6.75	3.12	1.10	.60	4.93	2.76	1.64	1.03
3	5.50	2.75	1.25	.87	4.79	2.05	1.75	.96
4	4.16	2.33	2.00	.83	5.01	2.22	1.76	.92
5	5.25	1.25	2.00	.83	4.30	1.68	1.89	.70
11	5.50	1.00	2.00	.50	5.10	1.84	1.78	.81
12	5.83	1.33	1.90	.59	4.35	1.89	1.89	.74
13	6.16	1.08	1.75	.87	4.43	2.15	1.82	.82
14	4.50	2.00	2.00	.75	4.73	2.01	1.82	.79
15	5.83	1.33	2.00	.75	5.03	2.25	1.79	.84
16	3.50	4.00	2.50	1.25	2.34	3.04	2.25	1.19
17	6.00	1.50	1.50	1.00	4.40	2.60	1.85	.97
18	4.50	1.50	1.75	.87	4.24	1.76	1.92	.71
19	4.50	1.50	2.10	.60	2.45	2.91	2.31	1.00
20	4.50	3.00	1.75	.87	3.87	2.59	1.95	.78
21	5.50	2.00	2.00	.75	2.66	3.48	2.27	1.20
22	6.00	1.75	1.50	1.00	3.92	2.27	1.89	.92
23	6.50	2.75	1.50	1.00	4.37	2.11	1.91	.70
24	4.50	1.50	2.00	.75	4.68	2.60	1.69	1.08
25	4.16	1.08	2.10	.60	3.50	3.27	2.14	1.11
26	5.00	1.75	1.75	.87	4.26	2.99	1.75	1.01
27	5.00	2.75	2.00	.75	3.86	3.25	1.90	1.03
28	6.66	1.33	1.12	.62	5.38	2.51	1.55	1.02

TABLE - B1	DPI				LVEC			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
33	6.00	.83	1.87	.62	4.73	2.12	1.82	.71
34	5.83	1.33	1.75	.87	4.59	1.82	1.86	.69
35	5.83	1.08	1.50	1.00	4.61	2.14	1.79	.85
36	5.50	2.00	1.75	.87	5.00	2.37	1.68	.98
37	6.00	.75	1.50	1.00	4.23	2.35	1.87	.78
38	6.16	1.08	1.25	.87	4.95	1.98	1.79	.82
39	6.50	1.00	1.10	.60	4.46	2.15	1.81	.95
40	5.50	2.00	1.83	1.08	4.24	2.14	1.80	.98
45	5.50	2.00	1.50	1.00	5.70	1.92	1.64	.97
46	4.83	1.08	1.90	.59	5.00	2.08	1.78	.80
47	6.50	1.75	1.50	1.00	5.18	2.16	1.71	.94
48	6.00	2.75	1.50	1.25	4.10	2.37	2.05	.81
49	6.50	2.00	1.50	1.00	5.30	2.25	1.72	.93
50	6.00	1.75	1.50	1.00	5.36	2.29	1.65	.99
51	5.50	2.50	1.50	1.00	5.73	2.20	1.61	1.02
52	5.50	2.50	1.75	.87	4.92	2.48	1.79	.91
53	5.50	2.50	1.75	.87	4.45	2.29	1.83	.84
58	5.25	1.25	2.00	.83	4.92	1.89	1.83	.74
59	5.83	1.33	1.50	1.00	4.94	2.01	1.75	.93
60	5.50	2.50	1.83	1.08	4.81	1.80	1.83	.79
61	4.50	2.25	2.00	.75	4.98	1.98	1.81	.79
62	6.50	3.25	2.00	.75	4.86	1.80	1.82	.83
68	4.50	3.50	2.00	.50	4.34	1.95	1.90	.63
69	5.00	2.75	2.00	1.50	4.26	2.36	1.87	.81
70	5.83	1.33	1.50	1.75	3.96	2.14	2.05	.81
71	6.50	1.25	1.10	.60	6.28	2.13	1.34	.99
72	6.00	2.50	1.50	1.25	5.81	2.12	1.45	1.01

90

TABLE - B1	DPT				LVEC			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
77	5.87	.62	1.16	.66	5.11	2.31	1.76	.92
78	6.00	.75	1.25	.87	5.18	2.01	1.68	.99
79	6.25	.87	1.25	.87	5.21	1.93	1.75	.91
80	6.50	1.00	1.10	.60	5.32	2.20	1.63	1.04
81	6.25	.87	1.10	.60	5.14	2.55	1.72	1.00
87	6.25	1.25	1.33	.95	4.56	1.96	1.91	.76
88	6.16	1.08	1.75	.87	4.25	2.16	1.83	.82
89	6.00	1.50	1.75	.87	4.41	2.32	1.80	.96
90	5.50	2.00	1.75	.87	4.02	2.93	2.02	.96
95	6.00	1.75	1.33	.95	4.97	1.67	1.82	.74
96	5.50	1.75	1.75	.87	4.97	2.20	1.79	.87
97	6.00	1.50	1.75	.87	5.17	1.90	1.74	.93
98	5.50	1.50	1.90	.59	5.38	2.24	1.63	1.01
99	5.75	1.12	1.90	.59	5.47	2.01	1.71	1.04
100	5.50	2.50	2.10	.60	5.08	1.97	1.77	.88
101	5.50	2.00	1.90	.59	4.75	2.49	1.88	.90
102	6.00	1.50	1.75	.87	5.45	2.05	1.69	1.01
103	5.16	1.08	1.90	.59	4.92	2.38	1.83	.93
108	*	*	*	*	*	*	*	*
109	6.75	1.12	1.10	.60	6.50	1.57	1.23	.87
110	6.25	.87	1.25	.87	5.96	1.93	1.45	1.01
111	6.75	.87	1.10	.60	6.19	1.70	1.36	.98
112	6.25	.87	1.25	.87	6.29	1.47	1.32	.96
117	4.75	.87	2.00	.50	4.55	1.45	1.91	.65
118	4.00	.75	2.00	.50	4.42	1.91	1.95	.77
119	5.50	1.25	1.90	.59	3.98	2.43	2.07	.83

TABLE - B1	DPI				LVEC			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
120	5.00	2.00	2.00	.75	4.30	2.03	1.91	.77
121	5.50	2.75	1.75	.87	4.84	2.43	1.79	.99
127	5.75	1.25	2.12	.62	4.45	1.53	1.94	.61
128	5.83	1.08	1.50	1.00	4.48	1.65	1.91	.65
129	5.90	.60	1.75	.87	4.41	1.71	1.90	.65
130	5.50	1.00	2.00	.50	4.83	1.78	1.87	.67
131	5.50	2.75	1.90	.59	4.65	1.68	1.97	.64
137	5.50	2.00	1.75	.87	4.85	2.15	1.82	.80
138	5.50	1.50	1.75	.87	4.74	1.94	1.78	.91
139	6.50	2.00	1.50	1.25	5.32	2.35	1.71	.94
140	6.50	2.00	1.50	1.25	5.32	2.07	1.67	1.00
141	5.00	2.50	1.75	.87	4.52	2.12	1.83	.95
142	6.00	1.75	1.90	.59	4.76	1.81	1.88	.69
143	6.50	1.25	1.25	.87	5.73	2.38	1.44	1.03
147	5.66	1.33	2.00	.50	4.88	2.24	1.79	.85
148	4.50	2.75	2.25	.87	4.97	2.75	1.82	.93
149	6.00	2.75	1.83	1.08	4.63	2.97	1.81	.95
150	6.75	1.12	1.50	1.00	4.67	2.14	1.88	.81
151	4.16	2.33	2.00	.75	4.25	2.32	1.91	.77
152	5.00	1.50	2.00	.50	5.58	2.86	1.54	1.12
157	5.50	1.50	1.90	.59	4.27	1.76	1.86	.68
158	5.00	1.50	2.00	.75	4.26	2.23	1.96	.73
159	5.50	1.25	1.50	1.00	4.17	2.58	1.97	.68
160	5.83	1.08	1.75	.87	4.35	2.12	1.98	.73
161	5.50	1.25	1.75	.87	4.36	2.15	1.95	.69
162	5.16	1.33	1.75	.87	4.44	2.21	1.92	.71

TABLE - B1	DPI				LVEC			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
163	5.75	1.12	1.83	1.08	4.48	2.04	1.85	.82
167	6.25	1.25	1.33	.95	4.82	1.85	1.72	1.02
168	6.50	2.00	1.50	1.00	4.94	2.73	1.69	1.01
169	6.50	1.25	1.50	1.00	4.66	3.15	1.76	1.05
170	6.25	.87	1.50	1.00	5.05	2.43	1.66	1.02

* The response choices for this item were inadvertently left off the form.

TABLE - C1

WBVTAE and Steering Committee Responses to Convergence Problems

Problem	WBVTAE N=12				Steering Committee N=8			
	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
1	5.75	2.12	1.30	.93	5.25	2.87	1.25	1.12
2	6.16	1.89	1.35	.97	6.00	2.33	1.30	1.10
3	6.50	2.00	1.83	.66	5.25	2.37	1.37	.97
4	6.10	1.25	1.50	1.00	5.00	2.75	1.30	.93
5	5.83	2.65	1.64	.97	4.33	2.00	2.25	1.54
11	6.83	.66	1.75	.87	4.16	1.08	2.25	.87
12	5.25	2.72	1.81	.73	4.75	2.50	2.00	1.25
13	5.75	3.56	1.71	.91	5.25	4.37	1.75	1.54
14	5.00	2.04	1.85	.83	3.75	5.25	2.62	1.68
15	6.00	2.90	1.78	.96	4.75	2.37	2.25	1.54
16	3.75	3.04	2.30	1.07	1.12	.62	2.66	.95
17	6.50	2.49	1.50	1.00	4.00	3.75	2.25	1.54
18	5.16	2.75	1.83	1.08	4.75	2.75	1.83	1.33
19	4.50	2.75	1.87	.75	2.00	3.66	2.50	1.25
20	5.16	2.50	1.92	.85	1.25	2.87	2.33	.95
21	6.25	1.39	1.50	1.10	1.50	2.75	2.33	.95
22	4.30	2.80	1.87	.75	2.50	2.50	2.33	.95
23	4.50	1.75	2.00	.50	1.50	2.75	2.12	.62
24	4.10	3.50	2.00	.75	1.50	3.75	2.16	.66
25	4.50	2.75	1.92	.85	1.37	2.18	2.50	1.25
26	5.83	2.25	1.70	1.20	1.33	1.33	2.50	1.50
27	6.00	1.58	1.35	1.23	4.00	3.00	2.00	1.50
28	5.16	2.99	1.50	1.50	3.00	3.37	2.62	1.18

TABLE - C1	WBVTAE				Steering Committee			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
33	6.00	.83	2.00	.50	4.50	4.50	2.00	.69
34	5.16	1.33	1.94	.66	4.16	1.50	2.10	.80
35	5.16	2.16	1.92	.85	4.16	1.33	1.91	.58
36	5.70	1.46	1.87	.75	1.50	4.25	1.50	1.50
37	5.75	1.66	1.66	1.06	4.00	4.37	1.33	.95
38	5.83	1.91	1.75	.87	5.75	5.25	2.00	1.50
39	6.50	2.50	1.66	1.06	2.75	3.87	1.83	1.08
40	5.50	2.00	2.00	.75	2.50	2.25	2.33	.95
45	6.00	.83	1.87	.62	4.50	2.50	2.16	1.33
46	5.16	2.25	1.90	.59	4.00	5.04	2.16	1.08
47	5.10	2.25	1.94	.66	5.00	4.37	2.00	1.25
48	5.00	2.50	2.00	.75	1.25	2.12	2.87	.62
49	6.00	1.58	1.50	1.00	5.25	1.75	1.62	.97
50	4.83	1.75	1.83	.66	5.16	2.00	1.75	1.08
51	4.83	2.33	1.87	.75	4.75	4.37	1.75	1.54
52	4.75	1.40	1.87	.75	4.66	1.37	2.08	.58
53	5.66	2.20	1.75	1.02	4.75	1.25	1.90	.79
58	5.33	1.79	1.60	.98	4.25	3.75	2.00	1.25
59	4.83	1.73	1.94	.66	4.75	4.37	1.50	1.25
60	5.50	2.08	1.90	.59	3.50	2.25	2.16	1.08
61	5.16	1.91	1.75	.87	3.50	3.25	2.50	1.25
62	5.25	2.06	1.85	.83	2.50	5.50	2.50	1.75
68	6.50	2.50	1.50	1.00	3.83	2.33	2.25	.87
69	4.75	1.50	2.00	.75	5.50	2.25	1.50	1.25
70	4.25	2.00	2.07	.85	2.50	2.00	2.75	.87
71	6.00	2.73	1.64	.97	5.75	2.25	1.37	.97
72	6.16	1.89	1.35	.97	5.50	2.00	1.25	1.12

TABLE - C1	WBVTAE				Steering Committee			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
77	6.80	.77	1.20	.77	5.25	2.37	1.37	1.18
78	6.00	2.24	1.64	.97	4.83	1.33	1.50	1.00
79	6.64	1.57	1.50	1.00	5.00	2.75	1.83	1.08
80	6.75	1.12	1.25	.87	4.00	2.75	2.16	1.08
81	6.75	2.62	1.35	.97	6.50	2.25	1.75	.87
87	6.60	2.30	1.40	.98	5.00	4.75	1.75	1.54
88	6.50	2.16	1.66	1.06	4.50	2.75	1.83	1.08
89	5.50	2.00	1.87	.75	4.00	2.12	2.12	.62
90	6.64	1.23	1.25	.95	3.75	2.25	2.25	1.62
95	6.75	.87	1.10	.60	4.25	1.62	1.50	1.00
96	6.75	1.12	1.25	.87	4.00	4.33	2.00	1.50
97	6.16	1.89	1.50	1.00	4.16	3.00	1.87	.93
98	6.83	.66	1.16	.66	1.50	4.25	2.25	1.25
99	6.10	1.25	1.35	.97	4.83	1.50	1.83	.56
100	6.37	1.26	1.28	.91	4.25	3.75	2.16	1.08
101	6.50	2.00	1.25	.87	1.20	1.90	2.87	.62
102	6.64	1.07	1.16	.66	3.66	2.87	2.10	.60
103	6.50	2.16	1.50	1.00	2.00	2.83	2.50	1.00
108	*	*	*	*	*	*	*	*
109	6.00	2.06	1.64	.97	6.00	3.66	1.37	1.13
110	6.25	1.39	1.35	.97	5.00	4.04	1.66	1.16
111	6.16	1.08	1.35	.97	5.25	2.66	1.20	.90
112	6.50	2.50	1.25	.87	5.75	3.25	1.66	1.16
117	5.75	.87	2.00	.50	4.25	1.87	2.00	.69
118	6.25	1.39	1.64	.97	3.50	2.25	2.00	.83
119	6.64	1.57	1.35	1.07	3.83	2.33	2.16	1.08

TABLE - C1	WBVTAE				Steering Committee			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
120	5.75	1.50	1.75	.87	4.50	3.50	2.00	1.75
121	6.50	1.25	1.25	.87	5.00	4.75	1.33	1.33
127	6.00	2.00	1.62	.97	4.37	.97	1.87	.93
128	5.50	1.35	1.64	.97	4.75	1.54	1.80	.77
129	5.83	1.08	1.64	.97	4.75	2.37	1.87	.93
130	6.25	1.39	1.50	1.00	4.50	3.00	1.83	1.08
131	5.75	2.33	1.83	1.08	4.00	3.75	1.66	.95
137	5.83	2.08	1.33	.95	4.33	1.33	1.87	.62
138	6.16	1.73	1.25	.87	4.50	2.00	2.16	1.33
139	5.75	1.66	1.78	.96	5.16	1.08	1.87	.93
140	5.83	1.91	1.66	1.06	4.87	2.06	2.12	.93
141	5.16	2.25	1.50	1.00	3.00	2.25	2.33	1.16
142	5.70	1.46	1.83	.66	3.87	2.06	2.00	.75
143	5.83	1.75	1.75	.87	5.00	4.37	1.50	1.75
147	5.33	1.37	1.91	.58	2.25	2.37	2.33	1.16
148	5.50	1.50	1.87	.75	1.50	2.00	2.75	.87
149	5.50	2.25	1.75	.87	2.00	1.75	2.50	1.00
150	5.25	1.66	1.90	.59	1.50	2.25	2.66	1.33
151	4.50	1.50	2.00	.75	1.25	1.12	3.00	.50
152	5.00	1.83	2.00	.75	1.50	3.00	2.33	.95
157	6.25	1.08	1.30	.93	4.00	1.75	2.00	.75
158	6.00	2.20	1.58	.99	3.75	2.50	2.50	1.25
159	5.75	2.43	1.58	.99	3.66	1.37	2.33	1.16
160	6.12	1.56	1.58	.99	3.50	2.66	2.50	1.00
161	5.87	2.16	1.71	.91	2.25	2.25	2.62	.97
162	6.20	1.16	1.41	.99	3.25	2.37	2.12	.93

TABLE - C1	WBVTAE				Steering Committee			
Problem	Magnitude		Priority		Magnitude		Priority	
	Q2	IQR	Q2	IQR	Q2	IQR	Q2	IQR
163	5.33	1.83	1.71	.91	3.50	2.25	2.50	1.25
167	5.50	2.00	1.50	1.00	6.00	1.37	1.20	.90
168	6.71	1.69	1.28	.91	5.16	1.08	1.25	.87
169	5.20	1.93	1.71	.91	5.83	1.33	1.12	.62
170	5.66	1.64	1.85	.83	6.00	1.75	1.50	1.00

* The response choices for this item were inadvertently left off the form.

TABLE D-1

Distribution of Median Values for Magnitude of Problems

Q_2 Values	Q_2 for Magnitude							
	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
6.80 - .89					3	1		
6.70 - .79					5	4		
6.60 - .69					5	1		
6.50 - .59	1				9	12	1	1
6.40 - .49								
6.30 - .39					1			
6.20 - .29	1	1	1	2	6	7	2	
6.10 - .19	1				8	3	1	1
6.00 - .09	5		2	3	10	14		4
5.90 - .99		2				1	1	
5.80 - .89	4	3	3	4	8	9	1	1
5.70 - .79	4	2	3	1	10	3	3	3

TABLE D-1 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
5.60 - .69	2	3	2	1	2	1		
5.50 - .59	17	17	9	1	7	24	1	2
5.40 - .49							2	
5.30 - .39		10	2	2	3		7	
5.20 - .29	5	4	2		4	2	1	6
5.10 - .19	15	9	6	1	9	2	6	2
5.00 - .09	10	16	15	1	3	7	6	7
4.90 - .99	3	2	5				11	
4.80 - .89	4	8	15	1	3	1	7	3
4.70 - .79	3	5	10	2	2	1	6	8
4.60 - .69		4	6					1
4.50 - .59	15	8	5		4	8	4	6
4.40 - .49		1	4				11	
4.30 - .39	2	5	2	2	1		7	3
4.20 - .29	6		6		1		9	4

TABLE D-1 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
4.10 - .19	3	2	6	1	1	3	2	4
4.00 - .09	3	2	1			1	1	9
3.90 - .99							3	
3.80 - .89	1			1			2	3
3.70 - .79		1	1		1			3
3.60 - .69	1	1						2
3.50 - .59						1	1	5
3.40 - .49								
3.30 - .39								
3.20 - .29								1
3.10 - .19								
3.00 - .09								2
2.90 - .99								
2.80 - .89								
2.70 - .79								1

TABLE D-1 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
2.60 - .69							1	
2.50 - .59								4
2.40 - .49							1	
2.30 - .39							1	
2.20 - .29								2
2.10 - .19								
2.00 - .09								3
1.90 - .99								
1.80 - .89								
1.70 - .79								
1.60 - .69								
1.50 - .59								8
1.40 - .49								
1.30 - .39								2
1.20 - .29								4
1.10 - .19								1

TABLE D-2

Distribution of Inter-Quartile Range Values for Magnitude of Problems

Q_2 Values	IQR for Magnitude							
	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
5.50 - .59								1
5.40 - .49								
5.30 - .39								
5.20 - .29								2
5.10 - .19								
5.00 - .09								1
4.90 - .99								
4.80 - .89								
4.70 - .79								2
4.60 - .69								
4.50 - .59	1							1
4.40 - .49								

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TABLE D-2 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
4.30 - .39	1							7
4.20 - .29								2
4.10 - .19								
4.00 - .09	2					1		1
3.90 - .99								
3.80 - .89				1				1
3.70 - .79		1						5
3.60 - .69	2	1						2
3.50 - .59	3				2	1		1
3.40 - .49		1					1	
3.30 - .39	3							1
3.20 - .29	1	2	1			1	2	2
3.10 - .19		2				1	1	
3.00 - .09	5	1		1	1	1	1	4
2.90 - .99		3	3		2		4	

TABLE D-2 (Con't.)

Q_2 Tables	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
2.80 - .89	1				1		1	4
2.70 - .79	1	2			5	9	3	7
2.60 - .69	5	5	2		2	1	2	2
2.50 - .59	10	4	1		5	7	4	4
2.40 - .49	1	3	1		2		6	
2.30 - .39	7	6	5		3	2	10	9
2.20 - .29	3	10	8	1	8	1	13	11
2.10 - .19	4	6	2	4	5		16	3
2.00 - .09	15	2	9	1	12	13	10	8
1.90 - .99	1	13	7	1	4		11	1
1.80 - .89	1	2	8		5		8	1
1.70 - .79	9	5	6	2	6	7	5	4
1.60 - .69	5	4	7	1	5		4	1
1.50 - .59	3	6	17		9	12	2	3
1.40 - .49		8	11	1	3		2	

TABLE D-2 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
1.30 - .39	3	4	5	4	7	8		8
1.20 - .29	5	2	8	1	5	11		1
1.10 - .19	2	4	1	4	3	4		1
1.00 - .09	7	2	3		4	13		3
.90 - .99	1	5						1
.80 - .89	2		1	1	4	8		
.70 - .79	2	1			1	3		
.60 - .69		1			2	2		1

TABLE E-1

Distribution of Median Values for Priority of Problems

Q_2 Values	Q_2 for Priority							
	VTAE							
	Directors	Instructional Services	Research and Planning	Student Services	WBVTAE	DPI	LVEC	Steering Committee
3.00 - .09								1
2.90 - .99								
2.80 - .89								2
2.70 - .79								2
2.60 - .69		1						5
2.50 - .59						1		10
2.40 - .49								
2.30 - .39	1				1		1	8
2.20 - .29	1	1				1	2	7
2.10 - .19	1	4	2	1		4	1	14
2.00 - .09	9	8	8	1	10	21	4	13
1.90 - .99	19	12	23	2	10	10	19	2

TABLE E-1 (Con't.)

Q_2 Values	VTAE				WBVTAE	DPI	LVEC	Steering Committee
	Directors	Instructional Services	Research and Planning	Student Services				
1.80 - .89	19	19	31	2	17	5	31	12
1.70 - .79	21	18	19	6	14	22	26	5
1.60 - .69	9	12	5	1	13		13	4
1.50 - .59	15	16	8	1	15	22	2	7
1.40 - .49	1		1		2		3	
1.30 - .39	8	10	5	4	11	3	3	8
1.20 - .29	2	3	4	3	10	7	1	5
1.10 - .19		2		2	3	10		1

TABLE E-2

Distribution of Inter-Quartile Range Values for Research Priorities of Problems

Q_2 Values	IQR for Priority							
	VTAE							
	Directors	Instructional Services	Research and Planning	Student Services	WBVTAE	DPI	LVEC	Steering Committee
1.70 - .79						1		3
1.60 - .69	2	1						2
1.50 - .59	2				1	1		11
1.40 - .49		1						
1.30 - .39	5	3						5
1.20 - .29	1	5			2	5	1	11
1.10 - .19	6	12	1		1		3	11
1.00 - .09	28	31	17	4	19	21	20	16
.90 - .99	22	14	15	7	32	3	31	21
.80 - .89	4	17	26	6	19	33	20	8
.70 - .79	15	10	15	2	15	10	19	4
.60 - .69	14	9	28	4	10	15	12	11
.50 - .59	7	2	4		7	17		3

PROBLEMS IDENTIFIED BY RESPONDERS
(Write-In Problems)

Item No. 4

VTAE Research & Planning Administrators:
In Agri Area only

Item No. 6

VTAE Research & Planning Administrators:
Define Number of female-male ready for industry course by each industry development unit - with or without training

WBVTAE Staff:
Student Financial Aids
Dynamics of certain markets
Determining present output in VTAE of DPI, U. of W. System, Private schools, etc.

LVEC's:
Determine effectiveness of programs
Job entry positions
K-12 Career Development
Part-time jobs for co-op students
Determining number of similar programs training for the same core of jobs in the same geographic area
The problem in Central & North Central Wisconsin is not enough jobs area available to accommodate the trained work force we already have
Identifying all entry level jobs
Survey and review of new job titles presently evolving and in recent years
Determining geography of job market
Demonstrate to the state of Wisconsin the need for more money to be put into vocational education
Statewide occupational survey for job clusters for visually impaired and blind.

Item No. 7

WBVTAE Staff:
Recruitment, orientation, encouragement of dropouts and alienated persons for persons with special needs
Emerging jobs and market readiness

LVEC's:
Skills needed at job entry level
Student - teacher relationship
Jobs for special ed. students
Coordinating Manpower Data WSES - VTAE - Local

Item No. 7 Cont.

DPI:

Determine what employers would like in entry level employees compared with urgent entrance requirements in marketing and distribution

Item No. 8

VTAE Research & Planning Administrators:

Identify number of employed from counties

WBVTAE Staff

Remedial, Tutoring, Coaching services for physically handicapped

Item No. 9

LVEC's:

Reading and interpreting services

How new jobs evolve and methods of teaching job transfer

Item No. 10

VTAE Research & Planning Administrators:

Determine value of WSES Outreach to serve in job placement and training referral in mileage problem

WBVTAE Staff:

Special job placement services for the handicapped and disadvantaged

Item No. 16

VTAE Directors:

Nursing

VTAE Instructional Services Administrators:

Short courses of less than semester length to meet immediate needs of small industries

Dental hygiene

A.D. Nursing

NLN

Radiological technology

VTAE Research & Planning Administrators:

L.P.N.

Cosmetology

Dental Assistant

Dental Hygiene

Item No. 16 Cont.

VTAE Research & Planning Administrators Cont.
- Health Programs
- Health
- Health Occupations
- A.D. Nursing
- Radiology Tech.
- Plan Para-medical and Health Centers
- P.N.
- Physical Therapy
- Air _____ and Power

WBVTAE Staff:
- H.O.E. program courses
- AMA - Council on Med. Edu.
- ADA - Council on Dental Edu.
- Div. of Nursing and Board of Regents
- State aid distribution policy
- Fiscal year standardization
- Uniform accounting system
- Program accountability *Q (high priority)
- Role of district boards
- Facilities
- Circuit relations program management
- Full year district operation
- Quarterly system and VTAE
- Career development - adult
- Professional development of all personnel

LVEC's:
- Data Processing
- Health Careers
- Health Occupations
- Health services area - not educ. agencies but health agency
- Programs for health care
- Health
- Health Fields - Trades
- Health, Labor Unions, Industrial Commission
- Health Services
- Career education
- Supervised job training
- Music instrument repair
- Art-creative
- Approval _____
- Voc.-Tech. schools
- Special short voc. courses
- Relevance of given accredition
- Power mechanics
- Metal lab
- Vo - ag
- Clerical and secretarial

Item No. 16 Cont.

LVEC's Cont.:
- DPI - voc programs
- North Central Accredit.
- Commerical art
- Building trades vs. unions
- Building trades
- Graphics
- Articulate with MATC, VTAE, District 9
- VTAE 9 - Wis. DPI
- I'm thinking of: Could students get graduate credit for individual or independent study courses toward college graduation

DPI:
- Distributive education - not accepted - North Central Association

Steering Committee:
- Satisfying AACSB programs vs. Business Education employment needs

Item No. 29

VTAE Research & Planning Administrators:
- Program planning with Minnesota schools based on job market need in Wisconsin and Minnesota
- Determine the validity of the "Ladder" Approach to occupational education

WBVTAE Staff:
- Articulating with employers
- Open education

LVEC's:
- Developing predictive devices to the use in selecting successful instructors
- Identifying by age 12, the students who will not be successful in the general education curriculum
- Get all teachers motivated to do curriculum work on behavioral objectives
- Possibility of central school vs. scattered satellite schools
- Developing job descriptions of school activities
- Articulating academic courses with vocational courses

Item No. 30

VTAE Research & Planning Administrators:
- Program application procedures with Upper Great Lakes Regional Commission
- Ed. technology

Item No. 31

VTAE Research & Planning Administrators:
Special programs for handicapped residents

Item No. 32

VTAE Research & Planning Administrators:
Shifting of Voc. Tech. Programs to the comprehensive high level for post-secondary program.

Item No. 33

VTAE Research & Planning Administrators:
Program planning for a study skills center

Item No. 41

VTAE Research & Planning Administrators:
Developing testing out packages for advanced standing

LVEC's:
Retooling teachers to the above
Lack of good AV Dept.
Assessment of relative effectiveness of "successful" instructional methods
Developing strategies for implementing new ideas (guides, activities, etc.) into the curriculum
Provide learning materials that directly relate to industrial setting.
Using behavioral objectives effectively.

DPI:
Determine effectiveness of learning manager approach

Item No. 42

LVEC's:
Determination and use of task analysis
Determine effectiveness of individually designed learning activity packages around each student's career objectives and used in a group situation. (The interstate D.E. Curriculum Learning Activity Packages will be ready by fall of '72.)

Item No. 43

LVEC's:
Converting from group instruction to individualized instruction

Item No. 44

LVEC's:
Organization of team teaching contract teaching

Item No. 54

VTAE Instructional Services Administrators:
Developing criteria for teacher selection attitudes, performance, prediction, etc.

VTAE Research & Planning Administrators:
Develop a model for career salary planning for certified employees using merit.

LVEC's:
Defining "career development"
Teacher evaluation
Students must know what they want. We can't force them to learn.
Useful material
Utilizing community in evaluation
Career development

DPI
Determine effectiveness of "met standard" grading and evaluation (See I.D.E.C.)

Item No. 55

VTAE Research & Planning Administrators:
Develop a model for merit plan for cleric employees

DPI:
Evaluate my job satisfaction as well as job satisfaction

Item No. 56

VTAE Research & Planning Administrators:
Measure dual industry support for hiring the vocational trained student

Item No. 63

VTAE Student Services Administrators:
Identifying job specialists graduates of voc. tech.
Determine needs of workers for upward mobility in marketing especially

Item No. 63 Cont.

LVEC's:
Identifying student "maturation" change factors
Somewhere in here needs to be research on where non-college bound people live and work to determine relevance of programs -- critical.

Item No. 73

VTAE Research & Planning Administrators:
Redefining role of student services
Design a faculty advisor model for use in voc-tech faculty assignments

VTAE Student Services Administrators:
Relating personnel counseling to academic success

LVEC's:
Developing career development continuity K-12
Especially jobs available with state and federal departments (agencies). Always too much red tape-- they say--can't work for the forestry, SCS, ASC, federal Land Bank, county or state department and they should be the ones helping in giving the student work experience.
Centralized U.S. Dept. Student Services set-up implementing voc. guidance & counseling

Item No. 74

VTAE Student Services Administrators:
Obtaining more SPS staff
Transfer credit
Assess effectiveness of priority supported mental health centers

LVEC's:
Money is the problem!

Item No. 75

VTAE Student Services Administrators:
Determining administrative reasons for SPS negativisms
Total student development providing educational opportunity for the total human being - not just vocational

Item No. 76

VTAE Student Services Administrators:
Identifying innovative ways of obtaining total admin. support for SPS functions in a modern tech- institute

Item No. 82

VTAE Research & Planning Administrators:
Study transportation need

VTAE Student Services Administrators:
Study to show how the black disadvantaged have been provided for as compared to what has been done for the white disadvantaged
Providing increased financial aids for disadvantaged students
Ways to convince the present administration about the needs of the areas disadvantaged population

WBVTAE Staff:
Technique for motivating disadvantaged
Programs and services for handicapped

LVEC's:
Developing procedures for identification of disadvantaged students
Relating voc. ed. teacher education to these needs
Identification of individuals are really disadvantaged and/or handicapped other than the criteria as set forth by the U.S. Office of Education -- with only a mild stretch of the imagination almost any student could qualify as disadvantaged or handicapped - Also we do not address the multiple handicapped student as much as we could.
Perhaps the greatest problem in our secondary schools is a lack of quality programs for the disadvantaged and handicapped

Item No. 83

VTAE Research & Planning Administrators:
Study fiscal need for student sides

WBVTAE Staff:
Collateral services to enable participation of disadvantaged
Effective learning activities and materials for handicapped

Item No. 91

VTAE Research & Planning Administrators:
Study transportation need

WBVTAE Staff:
Selecting and training staff for handicapped

LVEC's:
Should have work experience program
Identifying school district or counties for programs geared to meet these needs

Item No. 91 Cont.

LVEC's:
Programs for potential drop-outs
Prisoners of county jail training programs at our H.S.
Relating voc. ed. teacher ed. to these needs

Item No. 92

VTAE Research & Planning Administrators:
Study fiscal need for white student aids

LVEC's:
Re-evaluating programs for functional drop-outs (physically in school but accomplishing nothing)

Item No. 103

LVEC's:
Provide courses for humanizing teaching

Item No. 104

VTAE Research & Planning Administrators:
Develop an effective in-service program for clerical employees

LVEC's:
Re-evaluating curriculum to eliminate extraneous courses and material.
For disadvantaged instruction
Flexibility in use of experienced personnel in programs which do not have degrees
Teacher organization need help (JEA)
Quality control for off-campus UW courses

Item No. 105

VTAE Research & Planning Administrators:
Develop a model for merit growth of all employees

LVEC's:
For "handicapped" instruction

Item No. 113

VTAE Research & Planning Administrators:
Define career education in terms of equipment and teaching materials needed in trades - start developing program in high school

Item No. 113 Cont.

VTAE Student Services Administrators:
- Program of veteran recruitment
- Designing a four year career education program: H.S. Jr. thru - post high two year program = 4 years
- Possible change in attitude toward vocational (prestige, etc.)

LVEC's:
- Converting from group instruction to individualized instruction

WBVTAE Staff:
- Methods to accomplish articulation

LVEC's:
- Evaluation procedures
- Administration inservice on career education with prominent "believers"
- Implementation
- Teacher inservice career education
- Job description of who is responsible for career education
- Developing a very effective K-12 career education development program
- Teacher education for career education

Item No. 114

VTAE Student Services Administrators:
- Credit compensations for veterans

WBVTAE Staff:
- Promotion of acceptance of career education with traditionalist

LVEC's:
- Techniques on how special funding can be achieved for career education
- Staff inservice
- Survey how much integration is presently being done
- Career education resource materials

Item No. 115

Anonymous:
- Community information concerning career ed.

Item No. 116

LVEC's:
- Implementation of guidance

Item No. 122

WBVTAE Staff:
Identifying the responsibilities of the administrators

LVEC's:
The LVEC reporting directly to the superintendent and advising the principal and directors of instruction instead of having the LVEC report to principal in H.S. matters and director of instruction on district matters
Roles and relationships of LVEC

Item No. 124

WBVTAE Staff:
Administrators acceptance of education objectives

Item No. 132

VTAE Instructional Services Administrators:
Obtaining research data for new innovative techniques for facility planning

WBVTAE Staff:
Utilizing and developing action research in educational process

LVEC's:
Determining research needed.

Item No. 144

WBVTAE Staff:
Project proposal writing

Item No. 153

VTAE Research and Planning Administrators:
Determine the relationship between physical environment and student achievement

LVEC's:
Need more storage space

Item No. 154

VTAE Research and Planning Administrators:
Determine facility needs of new instructional methods

Item No. 154 Cont.

LVEC's:

Schools sharing programs, some are in operation

Item No. 164

LVEC's:

Revise and evaluate long range plans

Item No. 165

LVEC's:

Keeping an inventory

Item No. 171

LVEC's:

Need to understand the community needs of the people
Printed material covering P.R.

Item No. 173

LVEC's:

Anything on behavioral objectives, I marked research immediately because we are supposed to be developing them and have them done within the next year.

Appendix E

May 23 Steering Committee Meeting

MAY 23 STEERING COMMITTEE MEETING

I. Initial Activities

A. Welcome participants

B. Distribute expense voucher forms

II. Review the Objectives of the Project

A. Identify major problems faced by Vocational Education in Wisconsin (Visual)

B. Determine the overall goals for a convergence plan for research

C. Identify the relationships between these goals and the priorities for attaining these goals

D. Construct the convergence research plan

E. Determine the feasibility of implementing the convergence plan

III. Review Convergence Approach

A. Page the article - handout extra copies if needed

B. Bring out the following points

1. p. 422* - Benefits of a planned research program

2. p. 423 - Criteria for planning technique

3. p. 423 - General concept

4. p. 424 - Basic proposition

5. p. 424 - Idea of convergence

6. p. 425 - Define terms in the chart - see p. 430 for definitions

7. pp. 425-428 - Sample charts

8. Formulating program objective and developing the general logic system

*Page numbers refer to Carrese and Baker, 1967

a. Selection of major goals and sub-goals

b. Development of the logic system

9. We are meeting for less time. However, this is a start. I envision more meetings in coming year.

10. Procedure

a. Determine overall goals

b. Determine research logic (system)

c. Develop linear assay (research flow)

(1) Determine phases and their sequence

(2) Determine steps (emphasize definition - not a step in a project) (defined in objectives)

(3) Determine projects (or activities) (defined in terms of specific research)

d. Determine concurrent and supplementary assays

e. Define the information flow

f. Include decision points (See p. 434)

g. Transfer logic matrix into an operational program plan (to p. 435)

h. Review of research activities - p. 435

C. Select overall goal(s) to converge or "more effective delivery of quality vocational education to all Wisconsin Citizens who can profit from it."

D. What are the problems (barriers) to achieving this goal?

IV. Review the major activities initiated

A. Presentation to director's research committee - October

B. Meeting with the steering committee October 29, 1971 (this group)

C. Visits and discussions with Assistant Directors for Research and Planning and Instructional Services in each VTAE school

D. Contacts with LVEC's who contacted the Center for Vocational, Technical and Adult Education

E. Review of literature to distill additional problems

1. Professional journals

2. Research reports

3. Research newsletters, etc.

F. Each problem was placed on a 4 x 6 card and used to develop the survey instrument you received

G. Vocational Education problems survey conducted (VTAE, LVEC, DPI, Steering Committee, and WBVTAE)

H. Input to Director's Research Committee - decisions on recommended priorities

1. Sub-committee (March 30)

2. Committee (April 12)

I. Matrix Committee - April 18, 19, 20 (Ruel Falk, Rollie Krogstad, Mehar Arora, Allan May, and Warren Leonard)

J. Discussions and actions of Matrix Committee summarized and placed in graphic form

K. Today's meeting: Purposes

1. Review the work done on the project

2. Study and comment on the research matrix

3. Suggest modifications and additions

4. Suggest further action

V. Discuss the summary statistics in Tables A, B, and C from the Convergence Survey form (Hand out extra forms if needed)

A. Survey was used to validate problems and obtain suggested priorities

B. Q Statistics

1. Q_2

2. Q_1

3. Q_3

4. IQR - measure of agreement

C. Note the groups and sizes (N) in survey

D. Look at frequency of various Q_2 and P values

E. Identify major problems for each group

F. Survey results substantiate that program development to meet the needs of students and industry is of central concern to vocational educators

VI. Based on the results of the surve- the general logic system or framework for the research program was developed (Show Fig. 1 O.T.)

A. Program development to meet student and societal needs is central activity

B. (Briefly discuss each element and the flow)

C. Tie this in with flow 1 in the research matrix

VII. Overall Research Matrix

A. Define the major flows - research, information, and resources (O.T.)

B. Identify the phases - hand out dittoed sheet

VIII. Go to Phase I (O.T.)

A. Review definition

B. Define steps and relate to general logic system. Note that the lines between phases and steps are not hard and fast. Also, this is not a network that requires completion of all prior activities before undertaking a later activity.

C. Relate the several documents

1. General logic diagram (determine needs)

2. Phase I (identification and analysis of needs)

3. Step 1 (also 2 and 3) (identify needs)

4. Research problems (see survey form)

a. Magnitude of manpower needs - 1, 2, 3

b. Magnitude of social needs - 1, 4, 59, 78, 88

c. Integration - 5

5. Research projects - a problem may lead to several research projects:

Example:

Phase I

Step 1

Flow I-1-1A: Identify manpower needs

Projects: (1) Determine validity of WSES data

(2) Determine potential of newspaper ads as indicators of manpower needs

(3) Student location on first job as indice of manpower needs

(4) Geographical area to be used in projecting manpower needs

IX. Review Contents of Flows in Linear Assay

A. Flow 1 (core flow)

B. Remaining flows

C. Note the flowback of information

D. The lines connecting blocks show contingencies

1. Dependencies in planning research

2. Prior research required

3. Need for information exchange

E. Note that this would be a recycle process, i.e., more than once thru

X. Review the Other Flows (discuss contents)

A. Concurrent

B. Supplementary

C. Information

1. Problem and people retrieval

D. Resources

1. Personnel (note retrieval system)

2. Cost

3. Materials

4. Equipment and facilities

XI. Discuss Future Actions

A. Use of research matrix

B. Further development